ROADS AND STREETS

HIGHWAYS BRIDGES
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HEAVY CONSTRUCTION

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UNIVERSITY MICROFILMS
EUGENE B. POWER
313 N. 1ST ST.
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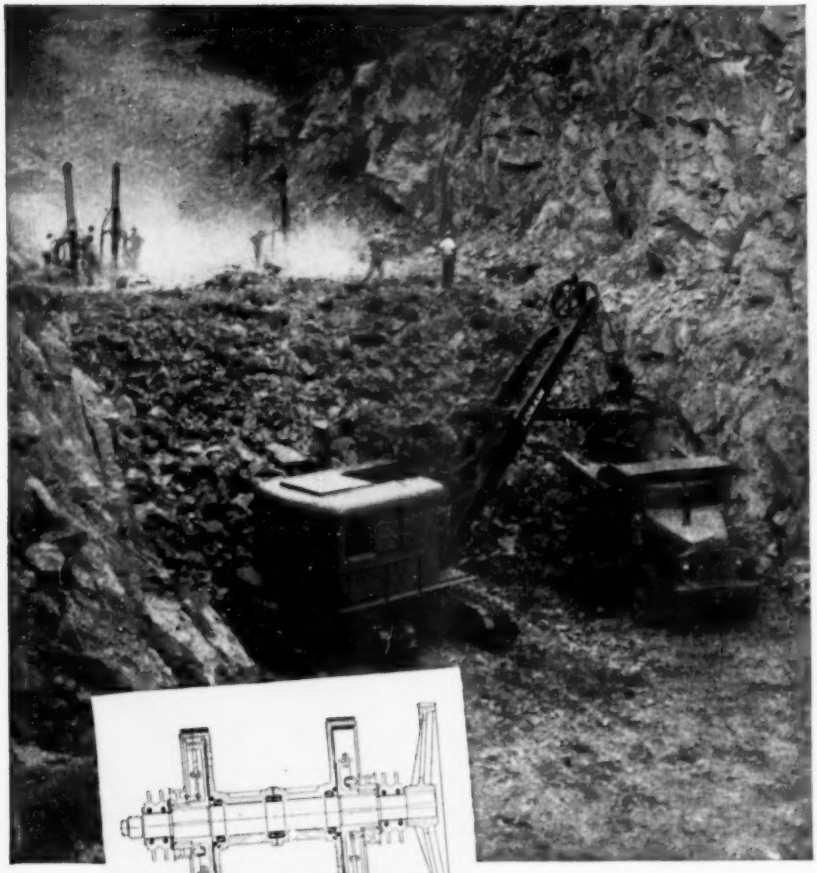
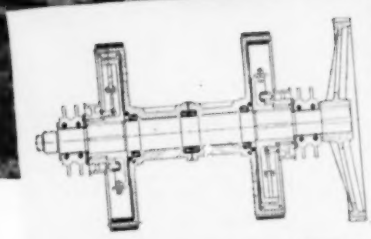
COMP-LRY-11-50

Speeds new Massachusetts pike

. . . with help of TIMKEN® bearings





How **THEW SHOVEL COMPANY** mounts the hoist shaft of its 2-yard Lorain 820-J Shovel on Timken tapered roller bearings for minimum maintenance and long life.

THERE were 1,500,000 yards of rock to move from this 4½ mile section of cuts on the new Boston to Lowell Turnpike. The whole job was done by this 2-yard Lorain 820-J Shovel and five of its brothers. To keep the shovels on the go with minimum time-out for maintenance and repairs, Timken® tapered roller bearings are used in the six turntable cone rollers, hydraulic coupling, horizontal swing drums, crowd and travel, and hoist drum of these 820-J's.

Timken bearings take the tough shock loads because they're case-hardened to give a tough, shock-resistant core and a hard, wear-resistant surface. Their tapered construction enables them to take both radial and thrust loads in any combination. Drums are held in rigid, positive alignment. Wear is minimized.

Because they keep drums and shafts concentric, Timken bearings make closures more effective. Lubricant stays in, rock dust and moisture stay out. Lubrication and maintenance time are held to a minimum.

No other bearing gives you all the advantages you get with Timken tapered roller bearings. Make sure they're part of the equipment you build or buy. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▷ BEARING TAKES RADIAL ↓ AND THRUST →↓← LOADS OR ANY COMBINATION ✳

P&H

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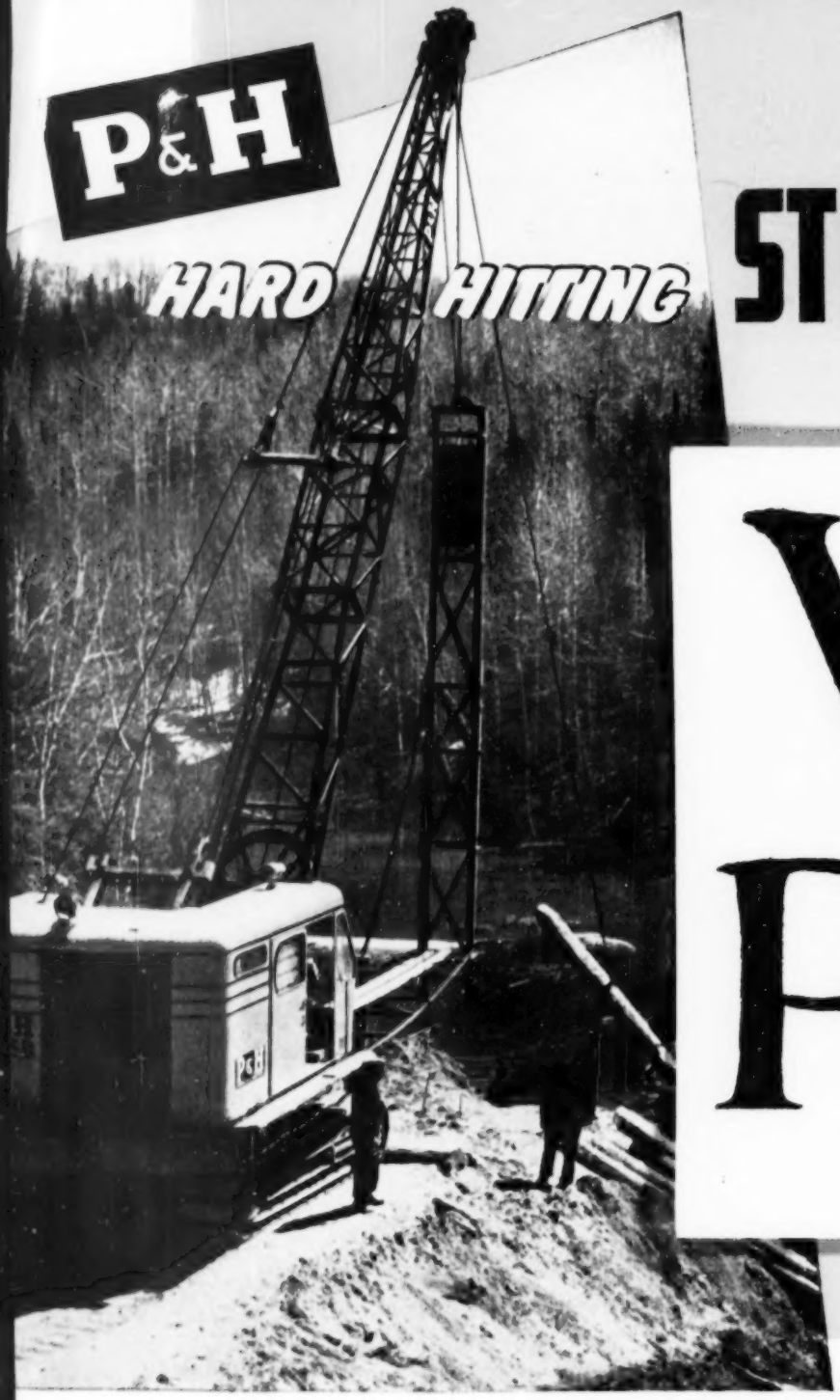
STABILITY!

No question about it— you've got it "on the hook" with a P&H!



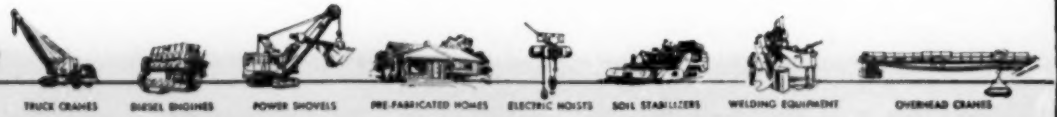
WA

PAG

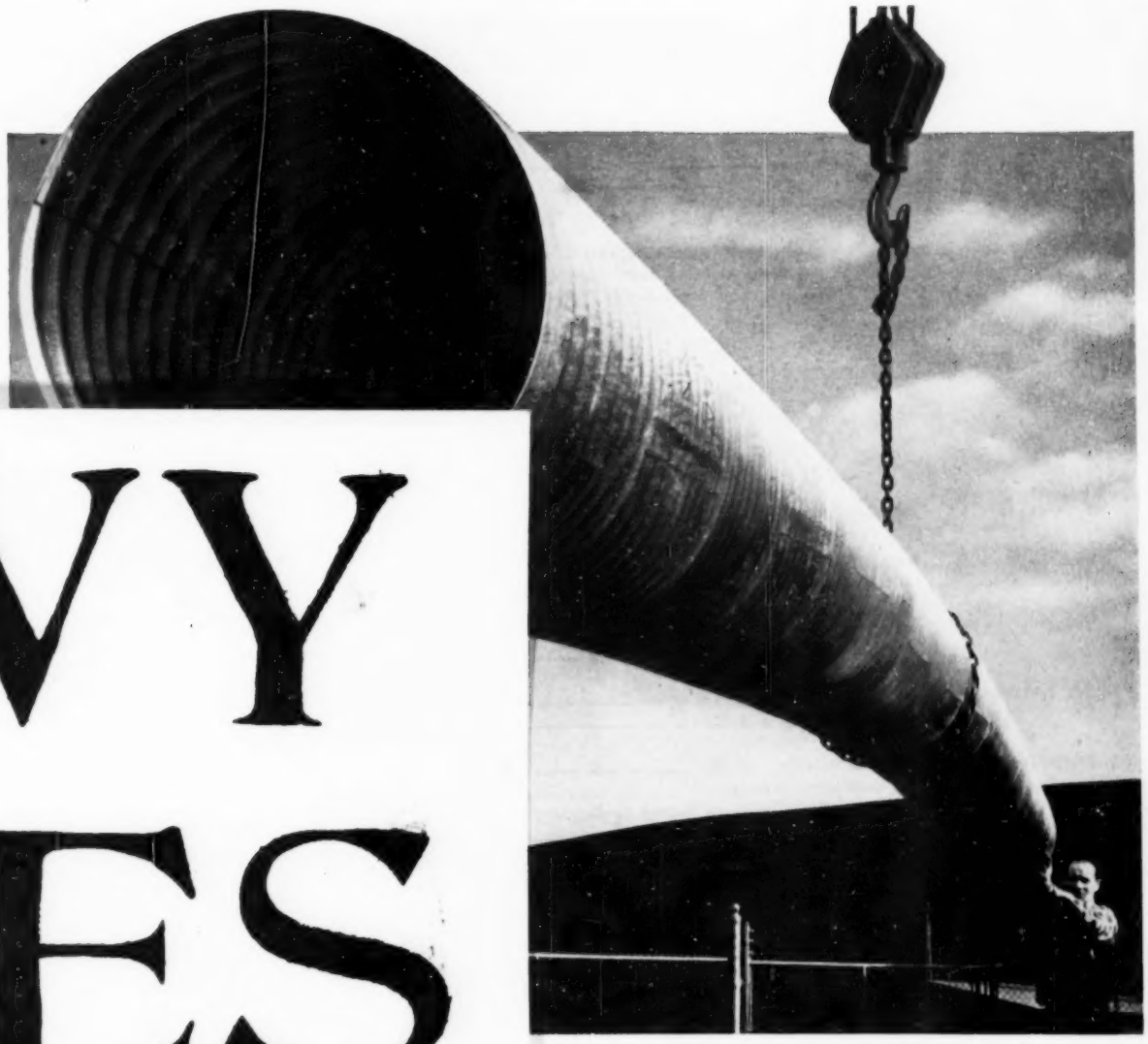
See your P&H Dealer!

Look to P&H for the most modern features in Power Shovel and Truck Crane construction. There's all-welded design, live roller circle, triple-safe boom hoist, hydraulic control, plus a low center of gravity that provides a higher ratio of lifting capacity to gross weight. This means more WORKABILITY . . . BETTER PERFORMANCE . . . GREATER SAFETY. Write for literature on the size you need.

The P&H Line



TRUCK CRANES · DIESEL ENGINES · POWER SHOVELS · PRE-FABRICATED HOMES · ELECTRIC HOISTS · SOIL STABILIZERS · WELDING EQUIPMENT · OVERHEAD CRANES



AVY

iES

for Flexibility

ıeter Culvert Pipe?

This 28-ft culvert is flexing under its own weight. Made of 16-gage galvanized sheet steel, it consists of two 14-ft sections joined by a single field coupling. Its total weight is 440 lb.

Large-diameter corrugated pipe of sheet steel has a high degree of flexibility and tensile strength. These properties allow the pipe to conform to irregular grade in a trench. They mean that the pipe can absorb changing loads caused by shifting or freezing soils, without pulling apart. And they permit it to withstand the impact and vibration of overhead traffic.

In addition, this kind of pipe weighs only a fraction as much per foot as comparable pipe of other materials. It comes in longer sections that are easy to handle without special lifting equipment, and that require the minimum of field joints.

COPPER-BEARING, CORROSION-RESISTING STEEL

Bethlehem does not fabricate culvert or drainage pipe, but does manufacture the Beth-Cu-Loy galvanized corrugated and flat steel stock used by pipe fabricators. This copper-bearing steel carries a heavy coating of zinc and has excellent resistance to corrosion. It more than meets Federal specifications, as well as those of the American Association of State Highway Officials.

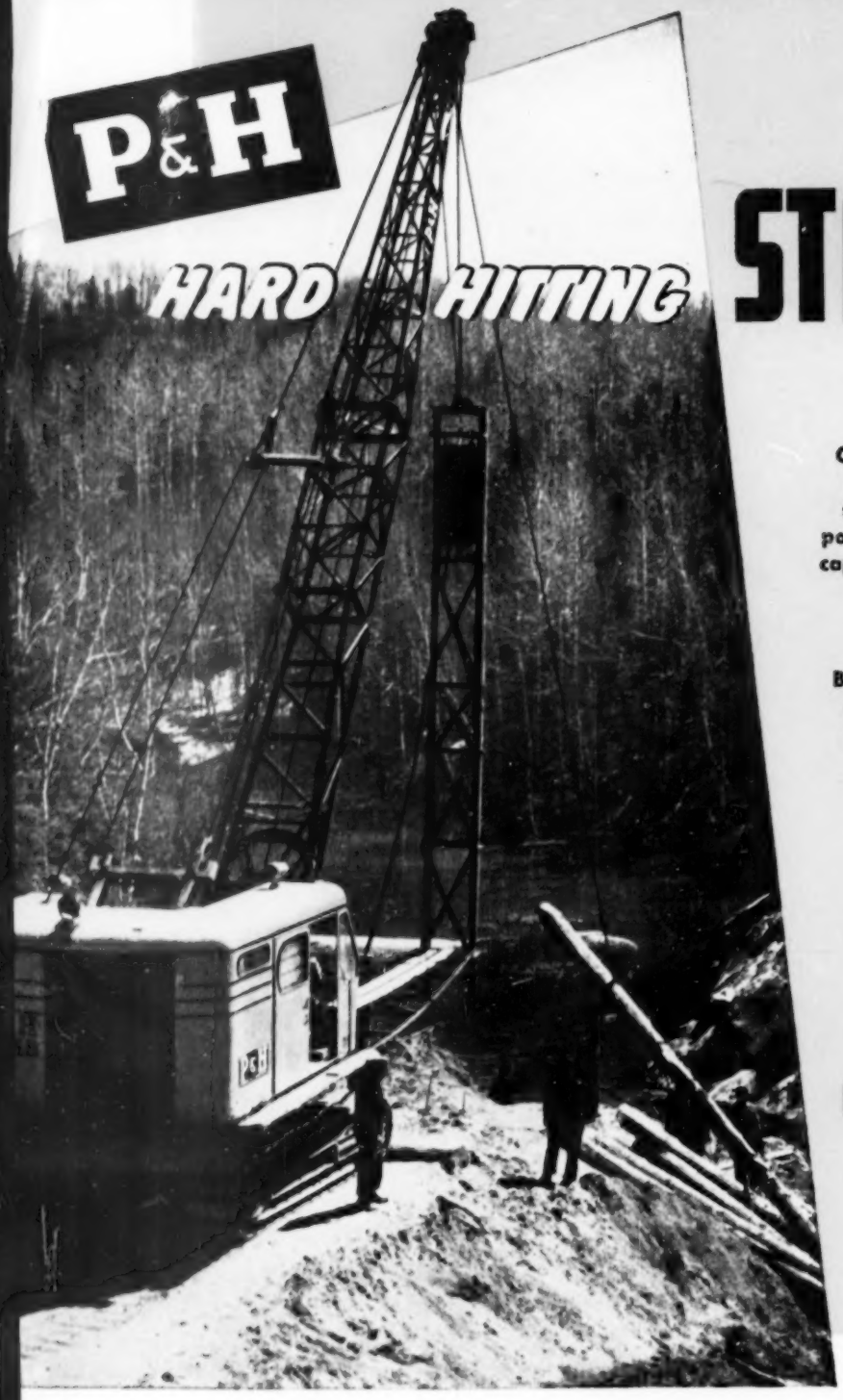
If you would like further information on Beth-Cu-Loy, or if you would like to know who uses it in culvert pipe, write or phone any Bethlehem office.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETH-CU-LOY *GALVANIZED* CULVERT SHEETS

BETHLEHEM STEEL



HARD HITTING STABILITY!

No question about it— you've got it "on the hook" with a P&H!

Greater stability not only lets you handle heavy loads with less danger of tipping strains, but also enables you to use your power more freely — gives you the added capacity to get more done in a day's work. Rolled alloy steels, welded throughout, give you the structural strength to take it in stride.

But it doesn't stop there. True tractor-type crawlers give you the smoothest, surest-footed mobility you've ever known on a power crane or shovel. You can turn gradually, sharply, or right about-face — maneuver in and out of tight corners with perfect ease.

You've heard P&H owners brag about what their machines will do. Isn't it time to find out for yourself? You've nothing to lose, much to gain in modern performance and lower costs.

P&H POWER SHOVEL AND CRANE DIVISION

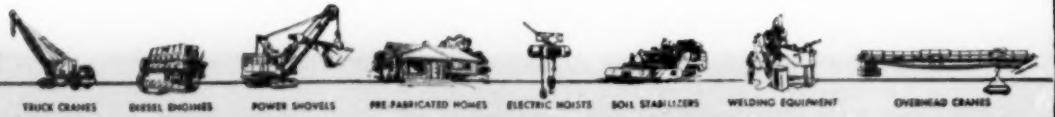
HARNISCHFEGER CORPORATION

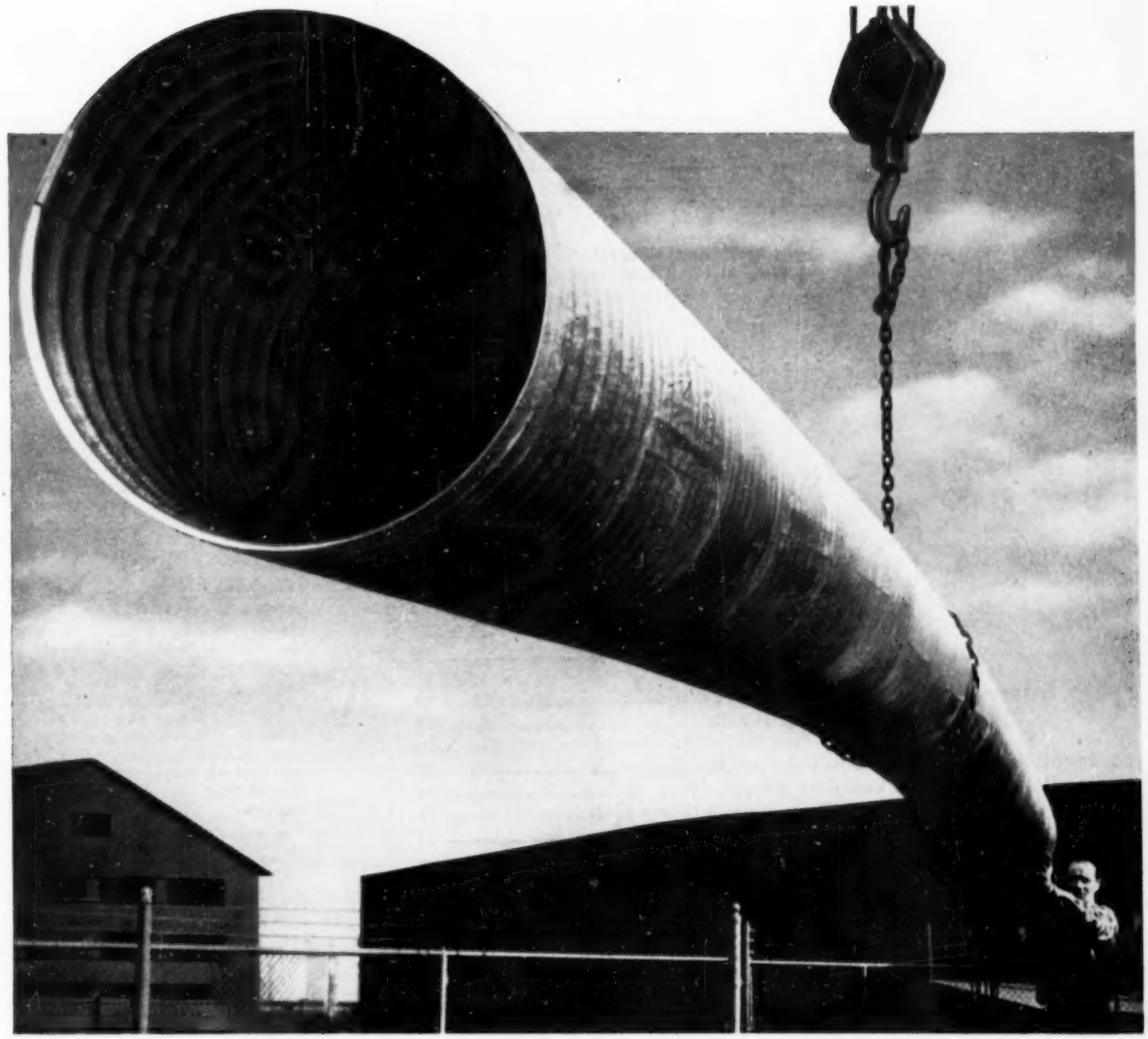
MILWAUKEE 46, WISCONSIN

See your P&H Dealer!

Look to P&H for the most modern features in Power Shovel and Truck Crane construction. There's all-welded design, live roller circle, triple-safe boom hoist, hydraulic control, plus a low center of gravity that provides a higher ratio of lifting capacity to gross weight. This means more WORKABILITY . . . BETTER PERFORMANCE . . . GREATER SAFETY. Write for literature on the size you need.

the P&H *Line*





How is this for Flexibility in an 18-in. Diameter Culvert Pipe?

This 28-ft culvert is flexing under its own weight. Made of 16-gage galvanized sheet steel, it consists of two 14-ft sections joined by a single field coupling. Its total weight is 440 lb.

Large-diameter corrugated pipe of sheet steel has a high degree of flexibility and tensile strength. These properties allow the pipe to conform to irregular grade in a trench. They mean that the pipe can absorb changing loads caused by shifting or freezing soils, without pulling apart. And they permit it to withstand the impact and vibration of overhead traffic.

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BETHLEHEM, PA.

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BETH-CU-LOY *GALVANIZED* CULVERT SHEETS

BETHLEHEM STEEL

ROADS AND STREETS

JANUARY, 1954 • VOL. 97 • No. 1

Roads and Streets represents 61 years of continuous publishing in the highway field; combined with Engineering & Contracting and Good Roads Magazines, established in 1892

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C. T. MURRAY, Managing Editor

ECA

COL. V. J. BROWN, Vice Pres. and Coordinator
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A magazine devoted to the design, construction, maintenance and operation of highways, streets bridges, bridge foundations and grade separation, and to the construction and maintenance of airports.

Coming Articles

Meeting Reports . . .

American Road Builders at Atlantic City, Highway Research Board at Washington, Asphalt Paving Technologists at Louisville.

Turnpike Construction . . .

During 1954 Roads and Streets plans a series of extra-ordinary analytical reports on the big toll road jobs. First one: crushing and stockpiling 3,000,000 tons of base rock for West Virginia turnpike.

A Veteran Contractor Talks About Equipment . . .

What are the factors in estimating a job and determining what the equipment fleet shall be for a given project? Read the provocative article coming soon by a well known contractor.

Design of a Small Prestressed Bridge . . .

Example of a pre-tensioned bridge design, with complete calculations, by Col. Brown of the Gillette staff.

Complete Reconstruction or "Fixing Up" . . .

An outstanding example of each design approach will be presented soon. One report will cover Oregon's relocation of U. S. 99 involving complete access control, as exemplifying a basic state policy. Another article will describe the widening, summit reductions, curve easement, and resurfacing of U. S. 20, New York.

OTHER PUBLICATIONS BY GILLETTE

Magazines

County and Township Roads
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World Construction
Caminos y Construcción Pesada

Prefiled Catalogs

Heavy Construction (U.S.)
World Construction (International)
Construcción Pesada
Water and Wastes
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What kind of tires can your jobs afford ?

THE kind that only great resources and great practical experience can build. The kind that are specifically designed for your types of jobs and equipment. The kind that are built *sparing nothing* to bring you the greatest traction or flotation, the greatest durability, the longest wear.

In short, the kind of tires that will keep your jobs rolling—save you time and money in every way!

No truly cost-wise operator can afford a lesser tire—and that's why more tons, the world over, are hauled on Goodyears than on any other make!

It stands to reason that Goodyear, who has built more tires for more purposes than anyone else on earth, can help cut *your* operating costs, too!

Goodyear, Truck Tire Department,
Akron 16, Ohio.

FOR EACH JOB, THERE'S A COST-CUTTING GOODYEAR TIRE!

Sure-Grip, All-Weather—T.M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

GOODYEAR

We think you'll like "THE GREATEST STORY EVER TOLD"—every Sunday—ABC Radio Network—THE GOODYEAR TELEVISION PLAYHOUSE—every other Sunday—NBC TV Network

New 1954 Chevrolet Trucks

New Power! New Economy! New Features you want!

New Chevrolet trucks for '54 are here to do your hauling or delivery job faster, more efficiently and more economically.

To begin with, they bring you thrifty new power in *all* models. You save time on every trip with extra reserves of high-compression horsepower under the hood—and you enjoy greatly increased operating economy as well.

In addition, these great new Chevrolet trucks offer new and even greater dependability with increased ruggedness throughout the chassis. You'll find heavier axle shafts in 2-ton models . . . bigger, more durable clutches in light- and heavy-duty models . . . more rigid frames in *all* models. Pickup and stake bodies are plenty rugged, too—and they're roomier for '54!

But that's only the beginning! You enjoy new cab comfort, convenience and safety. Instruments are easier to read . . . controls are easier to reach. A new one-piece curved windshield gives you greater visibility. The new Ride Control Seat* lets you drive in relaxed comfort hour after hour, over all kinds of roads. Seat cushion and back move as a unit to "float" you over bumps without back-rubbing.

In another great advance, new Chevrolet trucks offer you the last word in no-shift driving ease and convenience. With proved truck Hydra-Matic transmission* you can drive all day and make door-to-door deliveries without shifting or clutching. Fact is, there *is* no clutch!

These are some of the many big new benefits awaiting you in the new Chevrolet trucks for '54. Why not plan to get the whole money-saving story at your Chevrolet dealer's soon! . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

Most trustworthy trucks on any job!

CHEVROLET

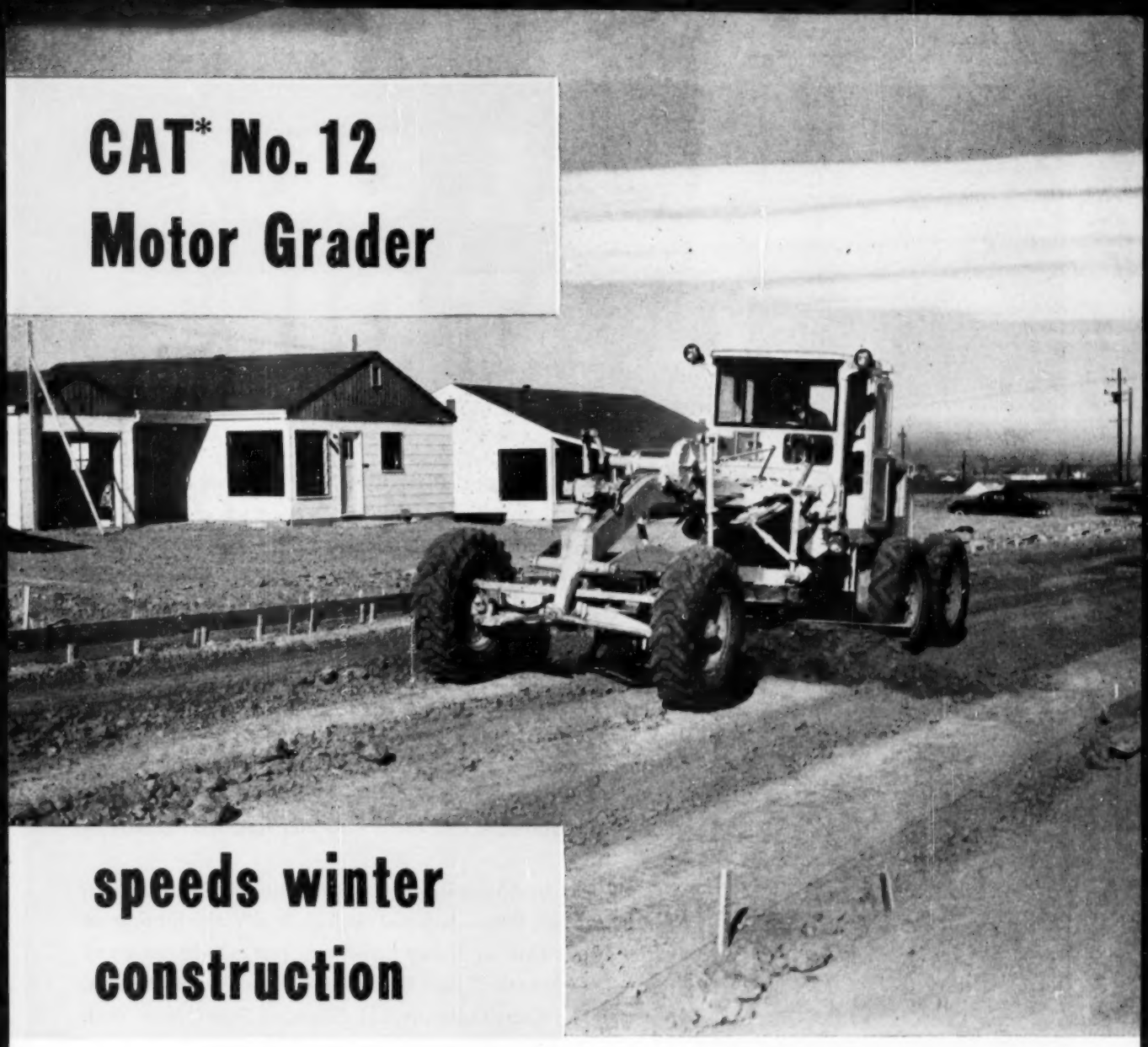
ADVANCE-DESIGN TRUCKS

CHEVROLET ADVANCE-DESIGN TRUCK FEATURES

THREE GREAT ENGINES—The new "Jobmaster 261" engine* for extra heavy hauling. The "Thriftmaster 235" or "Loadmaster 235" for light-, medium- and heavy-duty hauling. **NEW TRUCK HYDRA-MATIC TRANSMISSION***—offered on ½-, ¾- and 1-ton models. Heavy-Duty **SYNCHRO-MESH TRANSMISSION**—for fast, smooth shifting. **DIAPHRAGM SPRING CLUTCH**—improved-action engagement. **HYPOID REAR AXLE**—for longer life on all models. **TORQUE-ACTION BRAKES**—on all wheels on light- and medium-duty models. **TWIN-ACTION REAR WHEEL BRAKES**—on heavy-duty models. **DUAL-SHOE PARKING BRAKE**—greater holding ability on heavy-duty models. **NEW RIDE CONTROL SEAT***—eliminates backrubbing. **NEW, LARGER UNIT-DESIGNED PICKUP AND PLATFORM STAKE BODIES**—give increased load space. **COMFORTMASTER CAB**—offers greater comfort, convenience and safety. **PANORAMIC WINDSHIELD**—for increased driver vision. **WIDE-BASE WHEELS**—for increased tire mileage. **BALL-GEAR STEERING**—easier, safer handling. **ADVANCE-DESIGN STYLING**—rugged, handsome appearance. *Optional at extra cost. Ride Control Seat is available on all cab models, "Jobmaster 261" engine on 2-ton models, truck Hydra-Matic transmission on ½-, ¾- and 1-ton models.

MORE CHEVROLET TRUCKS IN USE THAN ANY OTHER MAKE!

CAT* No. 12 Motor Grader



speeds winter construction

As the mile-high city of Denver, Colorado, spreads out into the surrounding country, new housing developments and new streets are built fast. Allied Dirt Moving Co., a leader in this line, has made rapid street construction a fine art.

Even in midwinter the work goes on, thanks to Caterpillar machines. Cat D6 and D4 track-type Tractors rip up the frost. Then the No. 12 shown above moves in to do the grading and finishing.

Less down time is just one reason why contractors choose the No. 12 Motor Grader. In addition, it's the only machine of its kind built throughout by one responsible manufacturer and backed by one reliable service source. Operators like the easy way it handles, with ample power and sure traction. The blade can be adjusted through the full range of positions in less than a minute, without leaving the cab. And job visibility is excellent. The driver doesn't have to stand up to see what he's doing.

See a No. 12 in action on your own job. Check its production by the watch. You'll find this husky machine does *more* work in *less* time. Your Caterpillar Dealer will demonstrate any time you say. Give him a call today.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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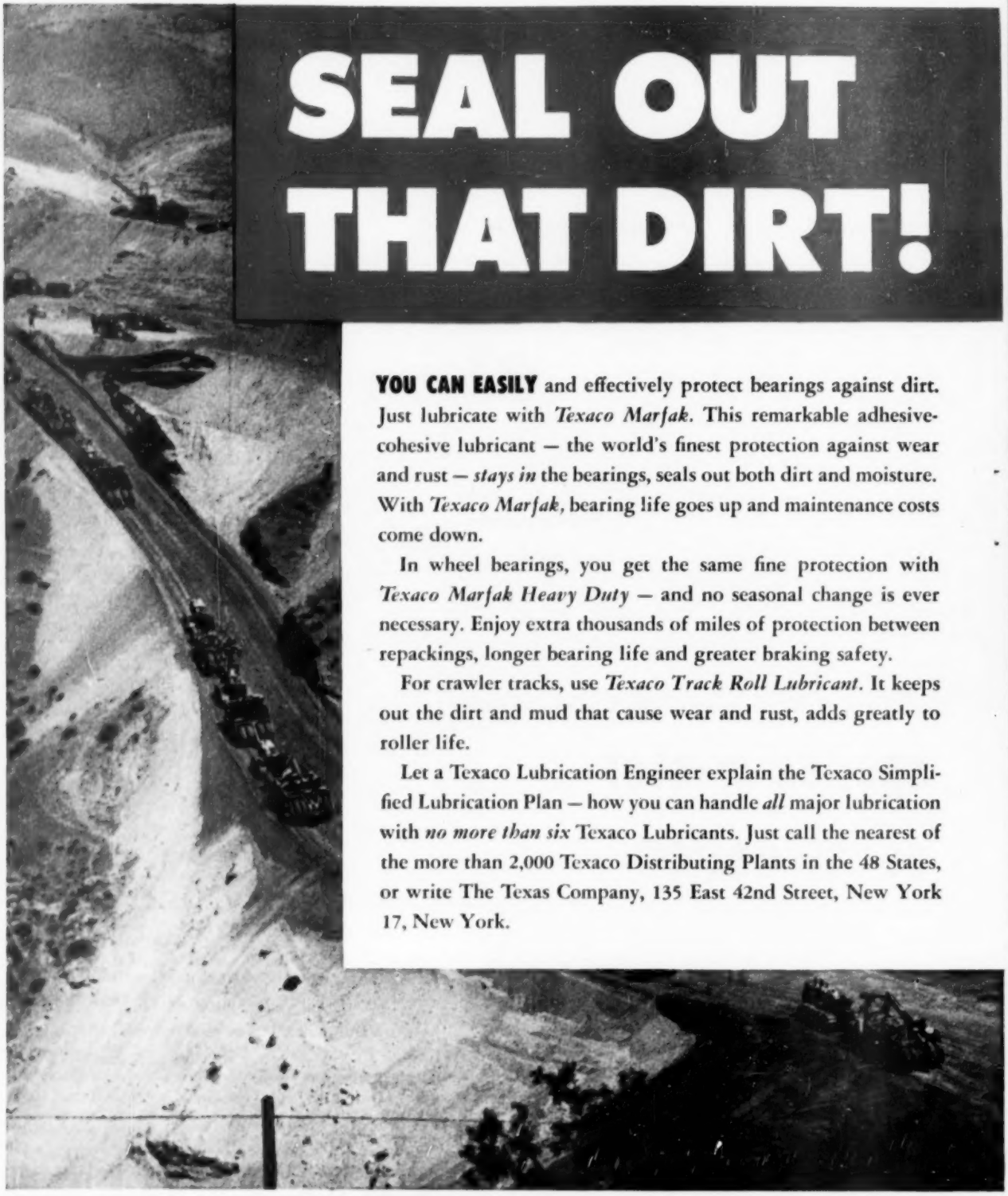

SEAL OUT THAT DIRT!

YOU CAN EASILY and effectively protect bearings against dirt. Just lubricate with *Texaco Marfak*. This remarkable adhesive-cohesive lubricant — the world's finest protection against wear and rust — *stays in* the bearings, seals out both dirt and moisture. With *Texaco Marfak*, bearing life goes up and maintenance costs come down.

In wheel bearings, you get the same fine protection with *Texaco Marfak Heavy Duty* — and no seasonal change is ever necessary. Enjoy extra thousands of miles of protection between repackings, longer bearing life and greater braking safety.

For crawler tracks, use *Texaco Track Roll Lubricant*. It keeps out the dirt and mud that cause wear and rust, adds greatly to roller life.

Let a Texaco Lubrication Engineer explain the Texaco Simplified Lubrication Plan — how you can handle *all* major lubrication with *no more than six* Texaco Lubricants. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, New York.

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every Saturday afternoon.
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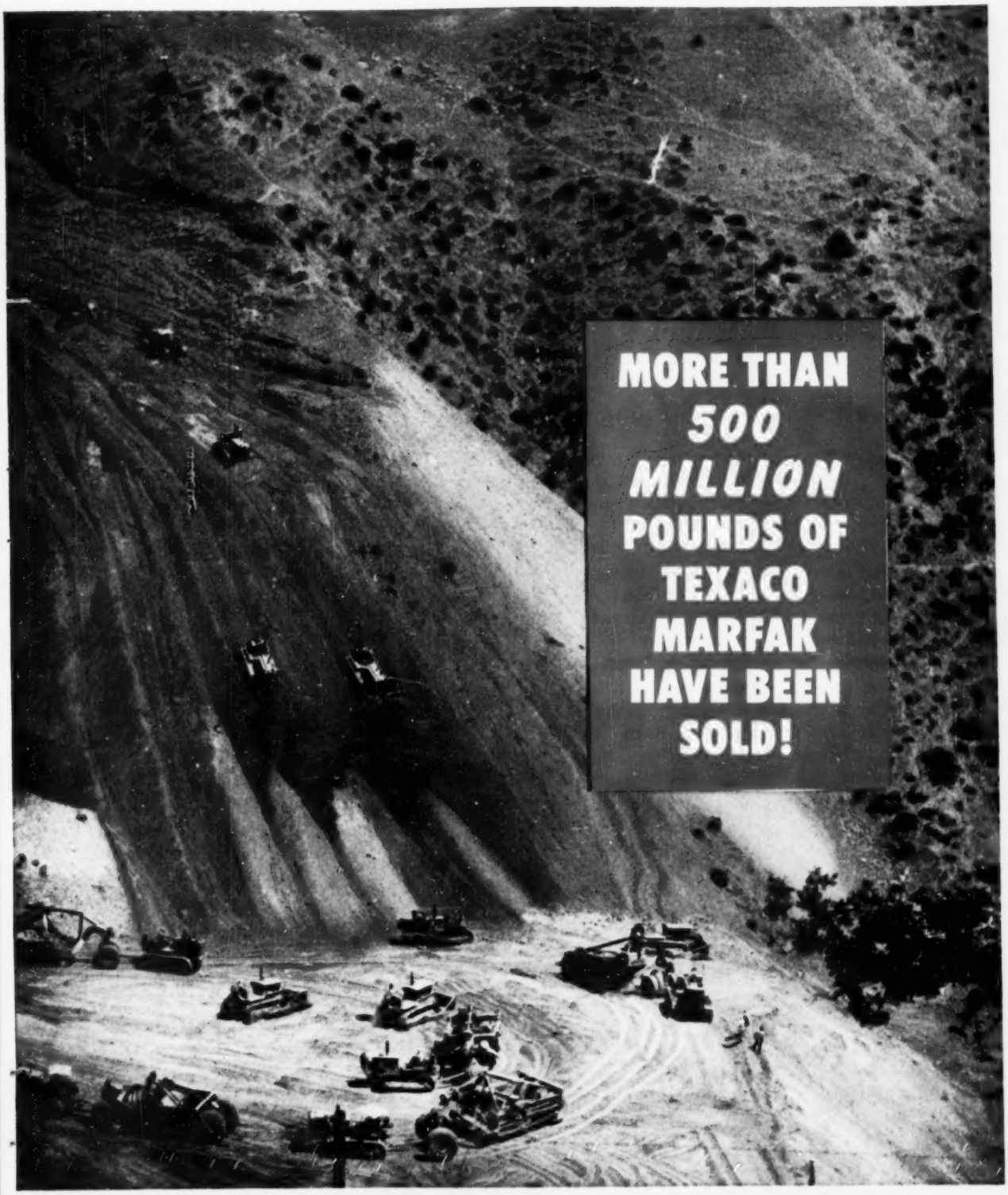
time and station.

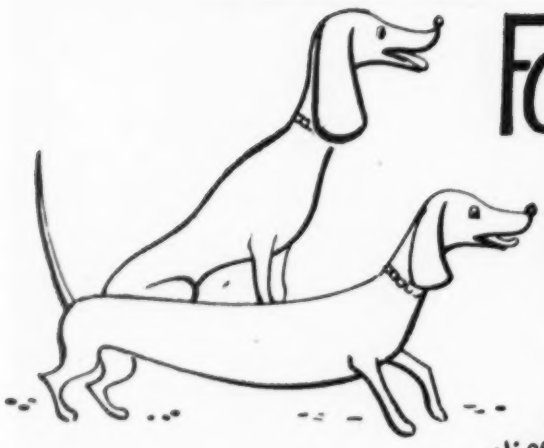
TEXACO

TEXACO



Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT



For Your Long Wheelbase Jobs!

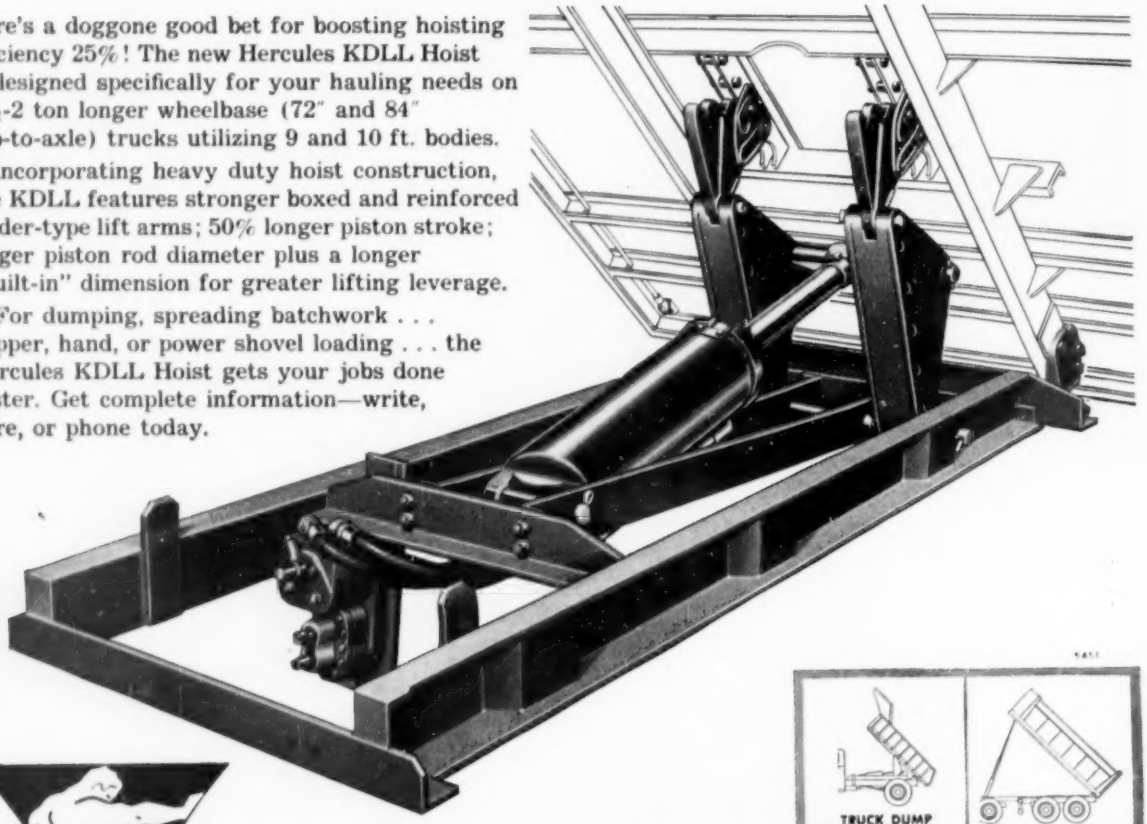
Specifically

New Hercules KDLL Hoist Engineered for 9 and 10 Ft. Dump Bodies

Here's a doggone good bet for boosting hoisting efficiency 25%! The new Hercules KDLL Hoist is designed specifically for your hauling needs on 1½-2 ton longer wheelbase (72" and 84" cab-to-axle) trucks utilizing 9 and 10 ft. bodies.

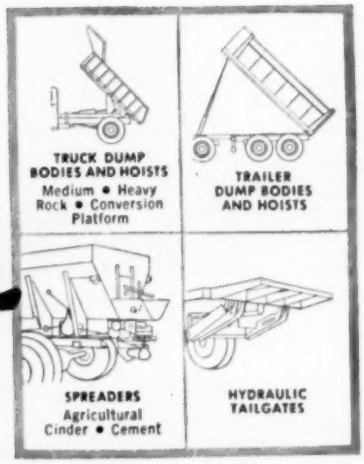
Incorporating heavy duty hoist construction, the KDLL features stronger boxed and reinforced girder-type lift arms; 50% longer piston stroke; larger piston rod diameter plus a longer "built-in" dimension for greater lifting leverage.

For dumping, spreading batchwork . . . hopper, hand, or power shovel loading . . . the Hercules KDLL Hoist gets your jobs done faster. Get complete information—write, wire, or phone today.



Hercules

buy from the line of strongest design

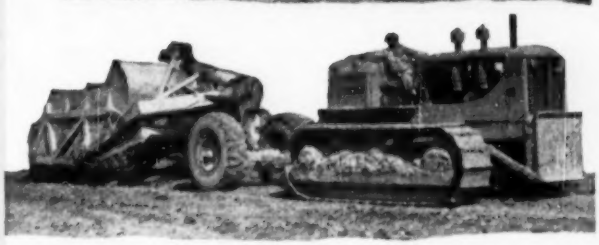

TRUCK DUMP BODIES AND HOISTS
Medium • Heavy Rock • Conversion Platform
TRAILER DUMP BODIES AND HOISTS
SPREADERS
Agricultural Cinder • Cement
HYDRAULIC TAILGATES

HERCULES STEEL PRODUCTS CORPORATION • GALION, OHIO

Get more Production from BUSY MACHINES

with PACAL BLADES

Day in and day out operators across the country are using Pacal Blades for cutting edge efficiency. With so many jobs to do they know that Pacal's abrasion resisting quality pays off in work done. Longer lasting blades mean fewer changes. Accurate punching means a better fit and faster installation. Pacal means a dependable supply.



USE PACAL BLADES on all your earthmoving equipment

Use Pacal Heat Treated Plow Bolts on all your Pacal Blades. They're twice as strong—do not stretch or loosen.

Only Pacal Plow Bolts and Pacal Blades have kept pace with the increased horse power of today's earthmoving machines.

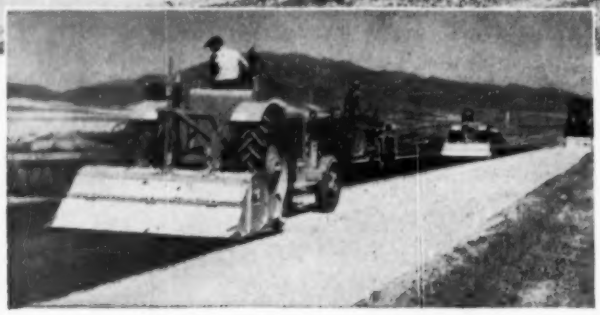
Write or call Department BK-14

Circular B 17

PAPER-CALMENSON & CO. County Rd. B and Walnut Street adjoining Hwy. 36
St. Paul B, Minn. Phone NEstor 9456

the SEAMAN TRAV-L-PLANT

SEAMAN Self-Propelled TRAV-L-PLANT pumps a controlled supply of water or bituminous material from a tank truck, meters it and applies it through spray bar directly into materials during mixing process. Idaho soil-cement stabilized highway.



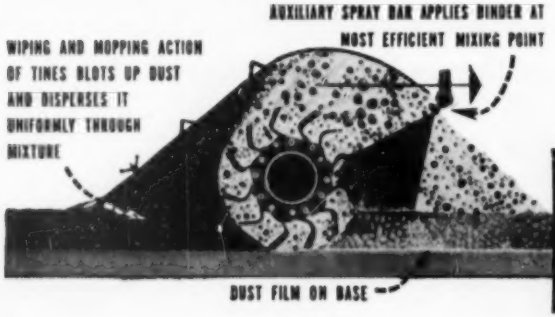
(Left) Same job as above.
SEAMAN Self-Propelled MIXER (without pumping equipment) is used to supplement mixing operations; is also used to mix-in water for previous pre-wetting operations.

Saves mixing time and water waste with "CONTROLLED MOISTURE" *during processing*

Water is often expensive. When you figure the cost of transportation to the job *and* the cost of down-time when tank trucks do not arrive when needed.

In any stabilization requiring added moisture the SEAMAN TRAV-L-PLANT conquers the cause of greatest water loss — evaporation. During processing the TRAV-L-PLANT pumps water from the tank truck through a spray bar positioned just ahead of the mixing rotor so that the moisture is applied directly into the materials while they are being mixed. A volumetric meter indicates the gallonage applied as well as the gallonage in flow at any given moment. Further, the rate of flow is controllable while the TRAV-L-PLANT is in operation so that changes in moisture requirement are instantly met. No slow penetration, no areas too dry or too wet. The water is uniformly incorporated.

Mixing depth is also accurately controlled to meet the rigid requirements for stabilization that are essential to obtain uniform flexibility and load-bearing value in the base.


AUXILIARY SPRAY BAR APPLIES BINDER AT MOST EFFICIENT MIXING POINT
WIPING AND MOPPING ACTION OF TINES BLOTS UP DUST AND DISPERSES IT UNIFORMLY THROUGH MIXTURE
DUST FILM ON BASE

This 12-page SEAMAN Bulletin illustrates mixing methods, shows many job scenes and completely describes SEAMAN TRAV-L-PLANT and Seaman Self-Propelled MIXER. Write for your copy of Bulletin TPS — today.

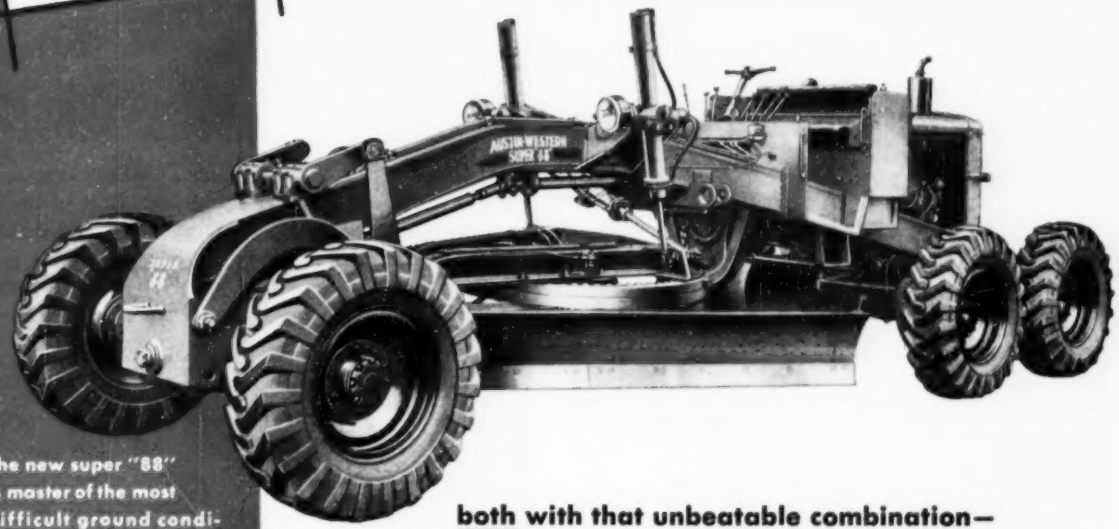
SEAMAN MOTORS Inc.

291 N. 25th STREET
MILWAUKEE 3, WISCONSIN

AUSTIN-WESTERN offers you your CHOICE of

NOW 6-WHEEL and 4-WHEEL GRADERS

in the popular "88" series



The new super "88" is master of the most difficult ground conditions. Four driving, steerable wheels at the rear team up with the live, climbing power of Austin-Western's famous front truck to provide flotation no ordinary motor grader can hope to equal.

both with that unbeatable combination—

ALL-WHEEL DRIVE and ALL-WHEEL STEER

Whatever the job . . . whatever the ground condition . . . your best buy among machines of medium size is an Austin-Western Power Grader of the "88" Series. With exclusive All-Wheel Drive for 30% greater Power-at-the-Blade; exclusive All-Wheel Steer for 100% greater Maneuverability, and exclusive "swing that rear-end" Controlled Traction for moving more material, farther and faster, the "88-H" Power Grader, with its four driving wheels (4x4), and the new Super "88" Power Grader, with its six driving wheels (6x6), will OUTPERFORM ordinary rear drive, front steer motor graders, definitely and completely.

4-wheel . . . or 6-wheel

Choose the model that's best for YOU!

Ask your Austin-Western distributor.

Austin-Western

Power Graders · Motor Sweepers
Road Rollers · Hydraulic Cranes

BALDWIN BLH LIMA-HAMILTON
Construction Equipment Division

Manufactured by
AUSTIN-WESTERN COMPANY
Subsidiary of Baldwin-Lima-Hamilton Corporation
AURORA, ILLINOIS, U.S.A.

Allis-Chalmers Construction Equipment

. . . helping small contractors and fleet owners to handle today's jobs at lower cost.

BETTER DITCHES result because an AD-40 operator can see graders front wheels and both ends of blade . . . because he has the advantages of Allis-Chalmers exclusive ROLL-AWAY moldboard.

ROLL-AWAY is an Allis-Chalmers trademark.

BACKFILLING on a water main and sewer construction job is just one of dozens of ways cost-conscious contractors use the versatile HD-5 Crawler.

ONE-MAN CONSTRUCTION CREW. This HD-9G with two cubic yard shovel, shown rough-grading here, also lifts, dozes, digs, handles most bulk materials faster, better, more economically than before.

FLEET OWNERS GO ALLIS-CHALMERS, TOO. Contractors find the design advantages of Persian orange equipment bring more profit to their operations; and that rugged construction keeps it on the job longer. Now, to fit their jobs, they can select from seven scraper sizes . . . for use with any tractor.

HIGH-SPEED DIRT-MOVING TEAM loads and hauls big yardage on this large-scale operation. An Allis-Chalmers torque converter drive tractor helps load a trio of TS-200 Motor Scrapers and gives them a fast, smooth start from the cut. Quick to get moving, these hydraulically controlled Motor Scrapers speed to the fill with capacity loads up to 13 cu. yd., and with positive forced ejection, dump fast and clean.

FINISHING BETWEEN FORMS takes precision work. That's what this contractor is getting from his Model D . . . the low-cost motor grader, proved on dozens of jobs by thousands of users.

WIDENING ROAD. Owner found his HD-15 gives him up to 25 percent more output on short cycle dozing because operator can go from any forward to any reverse speed in just one lever shift.

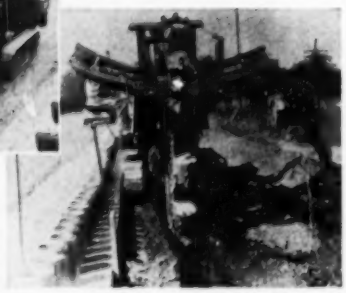
DIGGING TRENCHES. This hydraulically controlled, front-end trench hoe is only one of a dozen attachments making the Allis-Chalmers HD-5G the most useful tractor in the world.

CLEVELAND TRENCHERS

...For Better, Faster, Cheaper

HIGHWAY WIDENING

TRUCK LOADING



DRAINAGE TRENCHING

Highway Widening

Proved superior performance in highway widening and highway improvement work has brought about a widespread and ever-increasing use of Cleveland Trenchers in projects of this type. Here are just a few of the many underlying reasons for Cleveland's outstanding popularity in this field.

1. Clevelands complete the cut in one pass . . . help you keep all phases of a widening job close together, not strung out along the highway.

2. Clevelands cut clean, accurately, right to grade . . . make every cut a real precision job.

3. Clevelands cut fast . . . real mechanical efficiency, not brute force, for speed even on the tough jobs.

4. Clevelands truck load easily . . . no additional equipment or men are needed when spoil haul is required.

5. Clevelands are *versatile* . . . cut your tile trenches—dig *all* kinds of trench—give you high production at low cost—with minimum of service and repairs—day after day—year after year.

WRITE FOR CLEVELAND'S COMPLETE LINE BULLETIN S-111R

THE CLEVELAND TRENCHER CO.

Pioneer of the Modern Trencher

20100 ST. CLAIR AVENUE • CLEVELAND 17, OHIO

B.F.Goodrich

Tires recapped 2 and 3 times after rugged construction-site service

THE Corvallis Sand & Gravel Company processes rock into ready-mixed concrete, concrete block, drainage tile and other building materials. This Oregon firm transports its products to construction sites, operates construction machinery on excavating, grading and bulldozing jobs.

Tires take a terrific beating. Tire costs can skyrocket. Yet Corvallis reports that even after this rugged work, its B. F. Goodrich Rock tires can be recapped two and three times!

One reason for such outstanding tire performance is the patented BFG nylon shock shield. Layers of strong, nylon cords under the tread of B. F. Goodrich off-the-road tires stretch together to protect the tire body from smashing road shocks. This nylon shock shield gives you a 4-way saving: (1) more original hours of service (2) more recappable tires and more hours of service per recap (3) increased bruise resistance (4) less danger of tread separation. You pay nothing extra for this exclusive B. F. Goodrich feature.

And BFG Rock tires (above) have a specially-compounded tread that defies rock cuts and snags. The non-directional tread grips in forward or reverse, resists slippage. You lose no time rescuing bogged-down equipment.

B. F. Goodrich off-the-road tires give longer service at lower cost. See the complete line at your BFG retailer's. The address is listed under Tires in the Yellow Pages of your phone book. *The B. F. Goodrich Company, Tire and Equipment Division, Akron 18, Ohio.*

RESEARCH KEEPS B.F.Goodrich FIRST IN RUBBER

Specify B. F. Goodrich tires when ordering new equipment

Study Shows:

Average Yearly Repair Bill $19.61

PER ROLLER

On 26 BUFFALO-SPRINGFIELD 3-Wheelers Used By Large Eastern State.

Repair bills (materials and labor) were carefully logged on each of the 26 Buffalo-Springfield 3-Wheel Rollers used on all types of highway construction and maintenance in a large Eastern state. One of these rollers was in constant use for 12 years. Its total repair bill *for the entire period was less than $200.* That's an average of $16.39 per year! Only 4 rollers averaged over $30 per year for repairs. (Highest was $45.26 per year.)

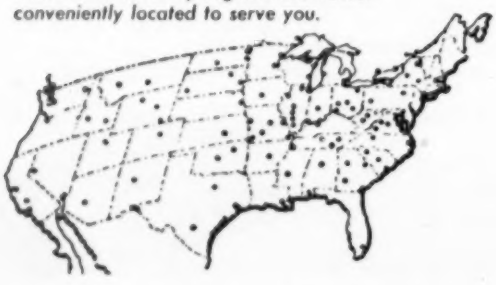
The average yearly repair bill for all 26 Buffalo-Springfield Rollers used was only $19.61 per roller.

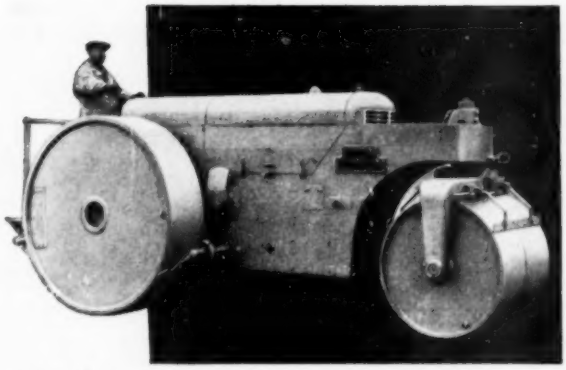
However, savings in repair bills are only a small part of the story. A key piece of equipment that breaks down can hold up an *entire job*, can cost tremendous sums in lost job-time, lost man-hours.

That's why you pay a little more to have Buffalo-Springfield high quality and fine engineered design. One breakdown *that didn't happen* can more than offset the higher initial cost.

Judge for yourself! How much did you pay for repairs last year? More than $20 per roller? How much did down-time and lost man-hours cost you? How many jobs were delayed by equipment that failed? Study the record of these 26 Buffalo-Springfield Rollers and compare.

There's a Buffalo-Springfield Distributor conveniently located to serve you.





This is the Buffalo-Springfield 3-WHEEL ROLLER.

Heavy-duty engineered for continuous service on toughest jobs. Features that give you wide job versatility . . . Exclusive 4-speed transmission to provide a continuous range of roller speeds from 1.1 to 5.0 mph, all at full engine power. Machine-finished ballast-type rolls. High-speed, low-torque clutches for even, smooth reversing. Many more. Models for weights from 5 to 15 tons. Ask for Bulletin S-60-50.

Exact Repair Costs (Materials and Labor) for Each of the 26 Rollers:

ROLLER No.	YEARS ON THE JOB	TOTAL REPAIRS (MATERIAL & LABOR)	AVERAGE REPAIR COST PER YEAR
1	8	267.17	34.64
2	3	8.00	2.66
3	5	36.24	7.24
4	8	109.90	13.73
5	4	28.75	7.18
6	4	15.65	3.91
7	6	125.82	20.97
8	7	135.50	19.35
9	4	72.10	18.02
10	7	132.08	18.87
11	9	195.82	21.75
12	9	190.40	21.15
13	7	168.14	24.02
14	7	169.59	24.22
15	7	79.37	11.33
16	7	264.80	37.83
17	6	67.35	11.23
18	7	192.92	27.56
19	7	246.69	35.24
20	7	147.04	21.00
21	8	134.59	16.74
22	5	20.43	4.08
23	7	181.12	27.88
24	7	118.50	16.65
25	7	316.88	45.26
26	12	196.79	16.39
	175*		$509.90 or $19.61 per roller

* Average almost 7 years on the job per roller.

See your distributor for complete information or write —

Buffalo-Springfield Roller Co.
Springfield, Ohio

BUFFALO SPRINGFIELD
THE STANDARD OF COMPARISON
SPRINGFIELD, OHIO

THE LEADER IN ROAD ROLLER DESIGN AND MANUFACTURE.

"Save money? Sure!"

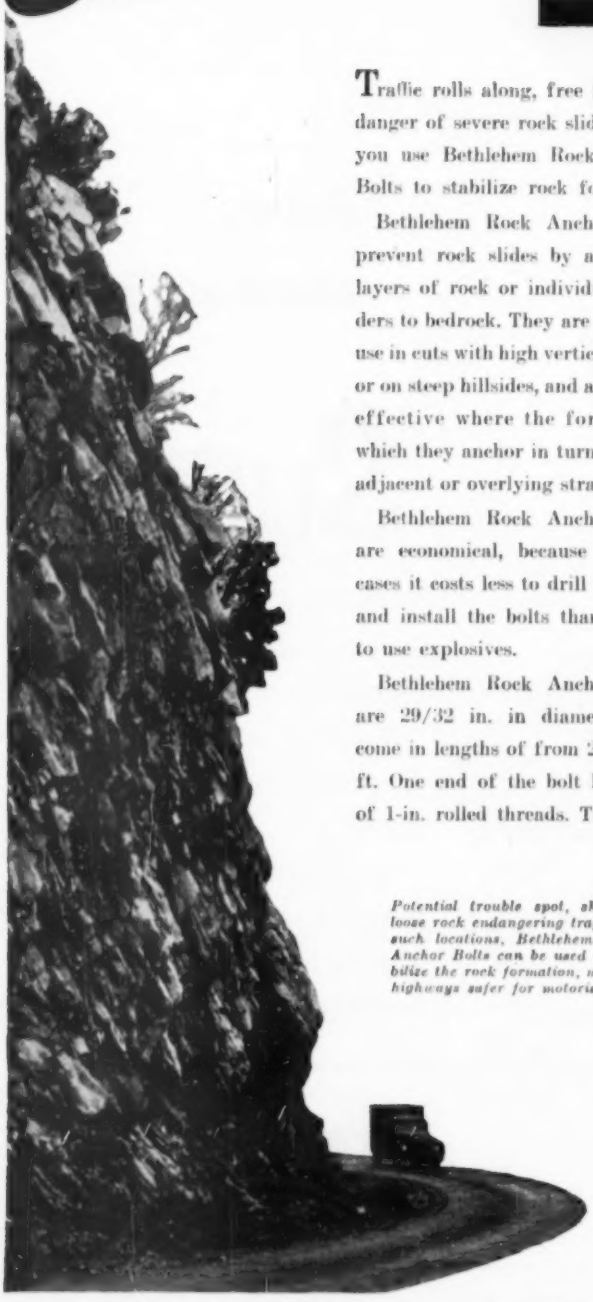
THAT, in a nutshell, tells you why so many wire rope users in excavating and construction prefer Roebling wire rope ... it speeds up operations... lasts longer on the job ... saves money that really adds up.

For the last word in wire rope efficiency and economy, call your nearest Roebling office or distributor for a Roebling recommendation.

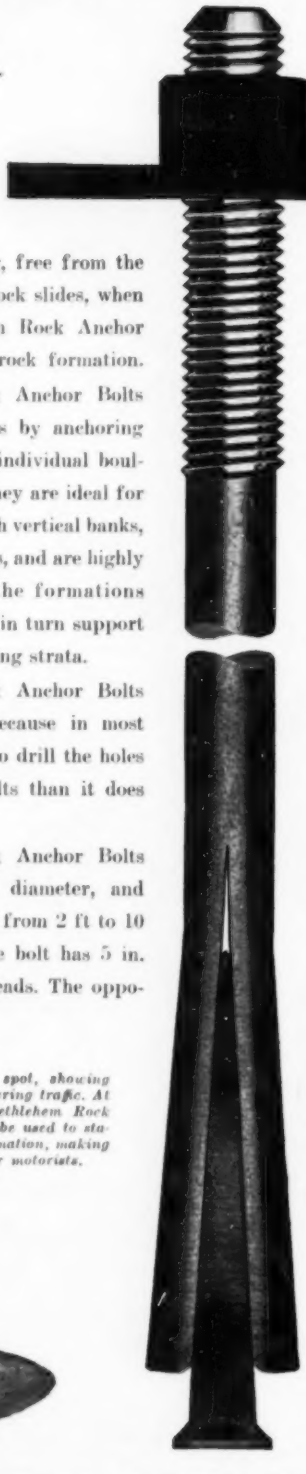
ROEBLING
A subsidiary of The Colorado Fuel and Iron Corporation

JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1930 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 331 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.

ROCK SLIDES CAN BE PREVENTED



Potential trouble spot, showing loose rock endangering traffic. At such locations, Bethlehem Rock Anchor Bolts can be used to stabilize the rock formation, making highways safer for motorists.



Traffic rolls along, free from the danger of severe rock slides, when you use Bethlehem Rock Anchor Bolts to stabilize rock formation.

Bethlehem Rock Anchor Bolts prevent rock slides by anchoring layers of rock or individual boulders to bedrock. They are ideal for use in cuts with high vertical banks, or on steep hillsides, and are highly effective where the formations which they anchor in turn support adjacent or overlying strata.

Bethlehem Rock Anchor Bolts are economical, because in most cases it costs less to drill the holes and install the bolts than it does to use explosives.

Bethlehem Rock Anchor Bolts are 29/32 in. in diameter, and come in lengths of from 2 ft to 10 ft. One end of the bolt has 5 in. of 1-in. rolled threads. The opposite end has a 6-in. slot, made by an exclusive forging process which forms the equivalent of two half-rounds. The slot accommodates a wedge which, forced deep into the slot when the back of the hole is reached, spreads the bolt-end to provide a tight fit. Installation can be handled with your present equipment.

Bethlehem Rock Anchor Bolts are furnished with an American Standard Square Nut. The bolts are placed horizontally or at an angle. They may be used in combination with rock anchor ties, plate washers, and angle washers.

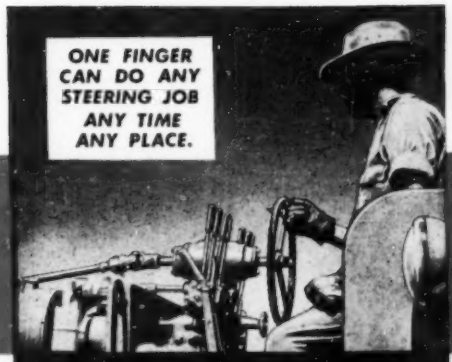
If you have a particularly dangerous stretch of highway which you feel may call for rock anchor bolts, write to us at Bethlehem, Pa., telling us about it. We'll be pleased to study the rock condition, and offer recommendations.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation.

BETHLEHEM STEEL

BETHLEHEM ROCK ANCHOR BOLTS



GALION LEADS-

BOOSTER STEERING

-OTHERS FOLLOW

LARGE FRONT TIRES

GALION also was the first to include large front tires (same size as on rear drive wheels) as *standard equipment* on their three largest size motor graders. This benefits GALION users by giving . . . greater flotation on soft ground . . . greater resistance against side drift . . . and higher axle clearance.

For *NINE* years, owners and operators of *Galion Motor Graders have *benefited most* because they have *received most* in STANDARD EQUIPMENT.

For *NINE* years, GALION has led competition by regularly providing a Hydraulic Booster in combination with manual steering. This feature results in . . . speed-up of operations . . . easier and more flexible maneuvering . . . more alert operators (less fatigue) . . . all of which means *more and better work accomplished.*

When you buy GALION — you get the BEST — you get the MOST for your money! Write today for literature.

***Three largest sizes.**

Ask your Galion Dealer to show you the color movie "GALION MAKES THE GRADE"

Hydraulic Booster Steering has been STANDARD EQUIPMENT FOR 9 YEARS

ESTABLISHED 1907

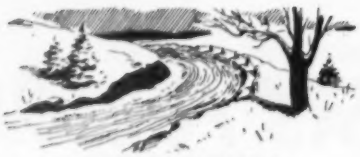
GALION

MOTOR GRADERS · ROLLERS

THE GALION IRON WORKS & MFG. CO., General and Export Offices, Galion, Ohio, U.S.A.

Cable address: GALIONIRON, Galion, Ohio

STERLING ROCK SALT SOLVES WINTER'S TWO TOUGHEST TRAFFIC PROBLEMS



HEAVY SNOW

Straight Rock Salt converts normal snowfall into slush for traffic to whisk away. Keeps heavier falls "mealy" for quick and easy clean-up by plow.

ICE AND COMPACTED SNOW

Straight Rock Salt's greater melting power perforates and breaks up ice crust, loosening it from pavement, to be worked to the side by traffic or by one pass of the plow.

Handle Your Ice and Snow...

TEN TIMES FASTER AT HALF THE COST

Ten times faster! One truckload of STERLING *Auger-Action* ROCK SALT covers up to 15 miles per load. The same truck, with abrasives, will cover 1½ miles only. *Rock Salt actually does the whole job—and does it better —in one tenth the time.*

Half the cost! STERLING *Auger-Action* ROCK SALT is easier to store and handle. It spreads faster and goes further. Your own accounting will show the cost per mile for rock salt about *half* that of outmoded abrasive-chemical combinations.

WHY STERLING *AUGER-ACTION* ROCK SALT DOES THE JOB BETTER!

STERLING *Auger-Action* ROCK SALT can be used in any mechanical spreader. Requires no special handling or treatment.

Each salt crystal, generating its own heat, quickly bores straight down through the entire crust of snow or ice.

As crystals reach pavement, they become brine which flows laterally, breaking bond between ice and surface.

Broken ice is easily removed with one pass of the plow or scraper. Heavy traffic spots clear themselves by friction of passing vehicles.

ORDER NOW . . . IN CARLOADS, BULK OR 100 LB. BAGS

STERLING *AUGER-ACTION* ROCK SALT

International Salt Co., Inc., Scranton, Pa.

SALES OFFICES: Atlanta, Ga. • Chicago, Ill. • New Orleans, La. • Baltimore, Md. • Boston, Mass. • St. Louis, Mo. • Newark, N. J. • Buffalo, N. Y. • New York, N. Y. Cincinnati, O. • Cleveland, O. • Philadelphia, Pa. • Pittsburgh, Pa. • Richmond, Va. • ENGINEERING OFFICES: Atlanta, Ga. • Chicago, Ill. • Buffalo, N. Y.

THE CASE OF THE PHANTOM TRACTOR THAT PULLS IN REAL PROFIT!

Ask any progressive owner or operator why he equips his tractor with a Hyster Towing Winch. He'll say, "It's almost like having a second tractor up ahead all the time... ready to help you when you need it most." That's another way of saying Hyster Winches greatly increase tractor uses for more profit.

Hyster Winches increase tractor pull up to 92% over drawbar pull!

Full tractor engine power can be extended the length of the winch-line. Permits tractor to reach out and rescue stuck equipment, pull in logs or heavy objects. Saves time and keeps jobs going in all kinds of weather.

Matched Design of Caterpillar-built Tractors and Hyster Winches provides proper balance to develop maximum tractive effort—with good operating stability and maneuverability.

Only Caterpillar-Hyster has *truly-matched* tractors and winches. Yes, and *only* Hyster has 19 models and sizes of winches to fit all Caterpillar-built tractors and for all types of winch jobs.

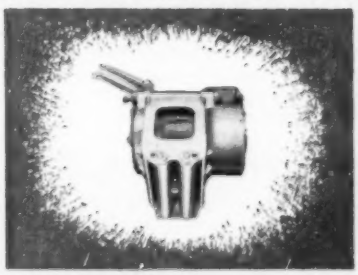
THERE'S PROFIT IN HYSTER POWER

Ask your Caterpillar-Hyster Dealer for the *right* winch to increase the profit on your job, or write to:

HYSTER COMPANY
2995 N. E. Clackamas . . Portland 8, Ore.
1895 N. Adams St. . . . . Peoria 1, Illinois

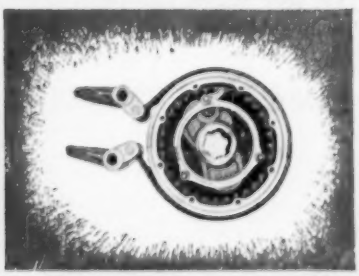
THERE ARE OVER 40,000 SATISFIED HYSTER WINCH OWNERS!

HYSTER TOWING WINCH ATTACHMENTS and FEATURES INCREASE WINCH EFFICIENCY and USEFULNESS



FAIRLEAD ASSEMBLY saves time maneuvering the tractor into yarding position. Reduces wear to winchline and tractor crawler assembly and saves fuel. Permits yarding from any angle to the rear of the tractor without the necessity of leading winchline straight from load to drum. (Optional for Models D8L, D7N, D6N)

BUILT-IN DRAWBAR provides added strength and rigidity to withstand severe vertical stresses encountered in arch logging and certain types of heavy-duty service. Yoke can be set in swiveling or non-swiveling (fixed) position. (Standard equipment on Model D8L, optional on D7N, D6N)

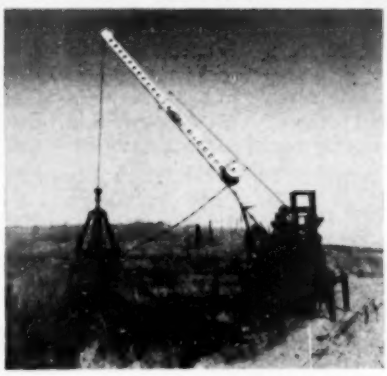


AUTOMATIC BRAKE, of special patented design, permits operator to pre-set brake before winching in a load—eliminates need for close coordination in controlling brake and clutch. For added safety, all brakes can hold loads greater than winchline capacity. (Optional on Models D8L, D7N, D6N)

HYSTER... the most complete line of tractor winches on the market!

HOW *Individual Design* IN EXCAVATORS

LOWERS MAINTENANCE COSTS



Inside and out, *individually designed* Bucyrus-Erie excavators are built to last longer. Materials and construction are specified for best results in each machine's rated yardage capacity. Each part is ample to carry its share of the load and deliver long service life. All are matched for top performance.

With *Individual Design* there is no excess weight—lightness is combined with great strength. This means low maintenance, real dependability. Machinery is conveniently arranged, accessible. This means routine maintenance and servicing is fast and simple . . . saves you time and money. Steady dependable performance, day in and day out, is just one of many extra values resulting from *individual design*. Let your nearby Bucyrus-Erie distributor tell you about the many additional advantages it holds for you. See him soon!

24E53

FOR JOBS TOO SMALL for larger machines, investigate the all-hydraulic Hydrocrane. For trenching and other specialized excavating—especially when the work requires squeezing into tight places—it's the stand-out performer.

BUCYRUS-ERIE COMPANY
SOUTH MILWAUKEE, WISCONSIN

INDIVIDUAL DESIGN . . . for each model in the line

⅜ to 4 cu. yd. gasoline, diesel and single-motor electric Shovels, Draglines, Cranes, Clamshells, Dragshovels.

Mack comes in costs go down

It happens all the time. A truck user finds that heavy loads, rigorous weather, or tough terrain are proving too much for the trucks he owns. Frequent breakdowns . . . interrupted output . . . excessive repairs—all conspire to boost his costs and cut his profit margin. Then—if he's smart—he switches to Mack six-wheelers.

And that's where he gets a real eye-opener. Because even under the most adverse hauling conditions—hub-deep mud, slippery sand or pitted rock-strewn ground—his Mack six-wheelers keep the big loads moving on dependable, time-saving, cost-cutting schedule.

The reason why? It's found in Mack's Balanced Bogie with exclusive Power Divider that assures positive traction no matter how tough the going. Acting normally as a true differential the Mack Power Divider delivers torque between the two bogie axles in proportion to wheel traction, thus eliminating useless wheel slippage and spinning.

Mack's Balanced Bogie and Power Divider combine with numerous other outstanding Mack features to give you the power, strength, traction and easy maintenance you need to handle the biggest loads—with greater profit to you. Your nearest Mack branch or distributor will gladly give you all the facts.

Mack TRUCKS

. . . outlast them all

Mack Trucks, Empire State Building, New York 1, N. Y. Factory branches and distributors in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Ltd.

A. Muratore Contracting Co., Brooklyn, N. Y., is typical of numerous contractors who switch to Macks and find they're the answer to lower-cost operation.

Caterpillar No. 6 Shovel gets the call on Chicago's biggest excavating job

Excavation for the huge 2350-car, multi-level, underground Grant Park Garage, on Chicago's lake front, involves moving more than 500,000 cubic yards of earth. It's the biggest job of its kind ever undertaken in the city.

When the digging started last spring, several competing types of tractor-shovels were tried out by Speedway Wrecking Company, excavating contractors. It was the Cat* No. 6 Shovel that won hands down.

The big bucket of this No. 6 handles 2-yard loads with ease. Loading into trucks, Speedway reports average production of 140 cubic yards per hour. And the machine turns in this kind of performance day after day without a hitch.

Excellent visibility, easy control, fast lift and turn action are added reasons why operators and owners both like this big, tough digging and loading tool.

All you need is a demonstration on your own job to be convinced. Your Caterpillar Dealer will arrange to demonstrate whenever you give the word. And he'll back the machine with top-notch service and genuine parts.

Remember—Caterpillar equipment not only *earns* more profit on the job—it's *worth* more when you want to sell. Look at your last cost first!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—®

Roads and Streets in the News

$800 Million Expressway outlined for Illinois

An expressway network in Illinois that would probably cost $800 million was outlined recently before the Illinois Highway Users Conference, by Evan Howell, chairman of the Illinois Toll Road Commission.

Chicago would be the hub of such a system whose first project would likely be a 40-mile stretch of U. S. 66 northward out of East St. Louis. Ultimate expressway development of U. S. 66 from Chicago to St. Louis is also contemplated; one from northern Indiana across the state to Iowa at Moline; a north-and-south route; also a St. Louis to Indianapolis project.

Surveys will eventually be undertaken for these routes and also for contemplated segments both through and by-passing Chicago. Trucking organizations are particularly active in their interest in the Chicago area locations, some of them pointing out that about 50 trucks travel into or out of Chicago for every one that wants to by-pass the city via an outer belt.

Large highway and bridge bond issues sold

During December, $99,800,000 in revenue bonds for the Mackinac bridge in northern Michigan was sold to a syndicate managed jointly by Union Securities Corp., Allen & Co., A. C. Allyn & Co., and Stifel, Nicolaus & Co., on a bid equaling a net interest cost of 4.349 per cent.

This flotation assures going ahead with the straits bridge which will have a central span of 3,800 ft., exceeded only by the Golden Gate bridge in length.

Sold also in December was the $280 million toll road bond issue for financing the Indiana toll road across the northern part of the state. This flotation was placed on the market by a country-wide syndicate of 475 investment banking firms. The bonds were purchased at 97.75 for a 3½% interest rate.

The Mackinac bridge contracts of $44,532,900 for superstructure to the American Bridge Company, and $25,735,600 to Merritt-Chapman & Scott for bridge foundations, were given final approval by the Mackinac Bridge Authority.

The Mackinac bond issue was attacked by Michigan State Treasurer, D. Hale Brake, as a "waste of money." He claimed, according to a news report, that the bonds will cost $64 million more than financing backed by state credit. State Sen. H. L. Nichols was denied a petition declaring the issue unconstitutional, by the State Supreme Court, which said that legal issues could be determined only after a full hearing.

Miller heads safety meet

Rear Admiral Harold Blaine Miller, USN (Ret.), has been named Director of the White House Conference on Highway Safety, called by President Eisenhower for February 17, 18 and 19 in Washington. The appointment was announced by Secretary of Commerce Sinclair Weeks, who will serve as General Chairman at request of the President.

Prior to his retirement in 1946, Admiral Miller was Director of Public Information for the Navy Department. He is head of the Department of Public Information of the American Petroleum Institute, and Executive Director of the Institute's Oil Information Committee.

Secretary Weeks will be assisted by Robert B. Murray, Jr., Under Secretary of Commerce for Transportation. Conference staff will be provided by the Bureau of Public Roads, under Commissioner Francis V. duPont, with headquarters in the General Services Building.

Venezuela opens $60,000,000 highway

★ Winding through the Venezuela mountains, the spectacular "Autopista" highway was opened for traffic late in 1953. Aerial view shows two of the three large pre-stressed concrete bridges on this 10-mile highway which rises from the harbor city of La Guaira to Caracas involving cuts and fills of unparalleled size. Costing $60,000,000 and requiring three years to construct, the road cuts driving time from one hour to twenty minutes. Note snake-like old road which new highway replaces. (United Press photo)

EDITORIAL

Financing of Roads a National Issue

When Congress takes up this month it will have few domestic problems more important than that of the nation's crumbling highways. Congressional leaders are expected to give thought to a greatly increased Federal participation in highway development—perhaps to the tune of nearly a billion dollars a year instead of the present $575 million annual rate of Federal highway aid.

This will be an "off year" in state legislative halls, but a very active one fortunately in advance planning and interim studies of highway need. Clearly the state legislatures must also find the courage to increase tax revenues for road building. Toll roads, while looming large in certain states, are not the answer in most localities.

The underlying fact is that the stream of automobiles and trucks represents such a tremendous economic force that people pay more indirectly for poor roads than for having adequate modern highways that will carry people and goods faster and more safely.

• Let us look at the over-all economic picture of the main highway system. A study of the Federal-aid system of 650,000 miles, made by the highway departments in 1949, showed that it would cost $29 billion to bring this system up to reasonable standards.

More recent surveys now show that the deficiencies are up to $40 billion —an $11 billion jump in the price of the job we have to do. Clearly we're "getting nowhere fast." The reasons are well known: 50 cent dollars and pre-war tax rates, and the greater cost of earth-moving, materials and other elements in today's broader, more streamline roadbeds. The Bureau of Public Roads Index, which is a yardstick for building a mile of a standard "1929" road, rose 9.2% from 1949 to date. This figure, however, does not begin to picture the true increase in the cost per mile of building a road adequate for arterial traffic. Such highways near cities today often must of necessity cost three to ten times as much as a 1936 model highway.

Meanwhile vast mileages of pre-war pavements are wearing out or becoming increasingly obsolete, more and more money is required to maintain these roads in usable shape, and the "deducts" of road funds for non-construction (yet essential) activities such as administration, engineering and maintenance keep creeping up.

• As the year-end appraisal of the highway picture in this issue indicates, road building people have reason to feel proud of the job they are doing today with available funds; localized progress has been made and in many areas the public is enjoying samplings of the kind of highways they should have everywhere.

Those who are seeking to enlist public and legislative support of larger highway programs might well investigate the Oregon method of deciding how much money should be invested in modernizing an old road. Stripping away political and emotional considerations, the Oregon engineers estimate the dollars-and-cents benefits that the new, straighter, safer, time-saving and vehicle-saving highway would bring. Studies for U.S. 99 and other arterial roads show that the benefits will pay for the cost of the reconstruction many times over.

What worthier public service is there than to mobilize tax resources, banking credit, engineering talent, construction techniques and available labor and materials into a "big-enough" highway program?

Besides helping fill uncounted dinner buckets immediately, the job will help underpin a continued rise of the American standard of living.

TELL IT TO OTHERS

It costs less to build good roads than to have poor roads. You pay for good roads whether you have them or not.—Thos. H. MacDonald.

Better Use of Equipment

Much of the equipment used today in building and maintaining roads and streets does a job that is so intimately connected with the technology of the field that there is a close community of interest between manufacturer, specifier and all others having to do with the quality and cost of the finished road. This observation is particularly true in regard to bituminous work.

The Barber-Greene Company is to be commended for the series of bituminous conferences it is holding at the factory this winter. At each of these conferences a "class" of association representatives, refinery engineers, editors and other "non-customer" people spend nearly three days reviewing the mechanical developments and applications of this firm's products and technical problems involved in making the most of such modern equipment to get a bigger dollar's worth for the public tax money.

Equipment makers today have a many sided selling and educational job. To be sure, they must convince the contractor or highway maintenance department that the equipment will do the work at hand and pay off. It must be sold to contractors on a profit making basis, or not at all. Beyond that, the manufacturer, specification writer, asphalt and tar producer, aggregate supplier and contractor must all understand each other's problems in order to best perform their respective jobs. The manufacturer may spend thousands of dollars and years of time in developing a machine, taking advantage of the best technical brains to do so, yet the road will be poorly built or the job will cost too much if the men in the field do not know the capacities and limitations of the equipment.

Noteworthy trend in Barber-Greene and some other equipment, by the way, is the increased portability which enables the contractor to pave three to five scattered jobs per season with fewer days of plant production lost in moving.

AED Meets at the Waldorf

THE contruction equipment industry this month was headed "en masse" for New York City, to attend the 1954 Convention of Associated Equipment Distributors, Jan. 31-Feb. 4 at the Waldorf Astoria Hotel.

Pre-Christmas registration had reached last year's record proportions, with over 2,000 people already counted. At last tally, 488 distributing firms and 255 manufacturers were sending representatives.

Moving A.E.D.'s 35th Annual Meeting to New York, after ten consecutive meetings in Chicago, required greater planning and consideration to detail than at any previous A.E.D. meeting.

With representatives from all segments of the construction equipment industry guaranteed, the business sessions of the 5-day meeting take on even greater importance. Similarly, the popular "Meet Your Manufacturer" period, scheduled for Sunday afternoon, January 31 in the Waldorf Astoria Hotel was expected to prove more valuable than ever before.

Get There Early

For some members the business of the convention will get under way immediately upon arrival. Meetings are scheduled for the Board of Directors and various committees on Saturday the 30th, while a number of manufacturers have made arrangements to entertain visitors all day Saturday, and Sunday until noon.

Local association presidents and secretaries will hold the Local Association Clinic starting Sunday afternoon. A program developed by Dick Newlin, Newlin Machinery Co., Kansas City, Kansas, chairman of the Local Group Clinic, ably assisted by Jack Randle, A.E.D. field secretary, will focus on activities and services of local associations.

The Convention officially kicks off Monday morning at the "Early Birds Breakfast," hosted by the Pennsylvania delegation. The first business session gets under way immediately afterward with A.E.D. International President, S. John Oechsle, presiding. Association affairs will take up the opening business session, with reports from association officers, directors and committeemen providing the basis of the meeting.

Dr. Kenneth McFarland, noted inspirational business speaker, will be the featured speaker at the Monday luncheon. In addition to his outstanding reputation as a public speaker, Dr. McFarland serves as educational director of American Trucking Associations, Inc. William A. Danner, A.E.D. past president, Parker-Danner Company, Hyde Park, Massachusetts, will be toastmaster. Monday afternoon and evening is open for distributor-manufacturer conferences.

Distributor Executives

★ S. J. Oechsle, Sr., president of AED, Metalweld, Inc., Philadelphia

★ R. J. Finn, A.E.D. vice-president, with Bode-Finn Co., Cincinnati

★ G. W. Gagel, executive vice-president of AED; Machinery & Supplies Co., Kansas City, Mo.

The second business session Tuesday morning, at which A.E.D. Executive Vice-President George W. Gagel will preside, will deal with distributor business problems. Several distinguished speakers will discuss methods of effecting economies through management control and tax procedures. Attendance at this session is restricted to distributor members.

Continued distributor-manufacturer conferences have been scheduled for Tuesday afternoon in both the Waldorf and Barclay Hotels, co-convention headquarters.

The session on building distributors' sales, on the program for Wednesday morning, promises to be one of the best of the convention. R. J. Finn, A.E.D. vice-president, will preside over an outstanding panel group. During the course of this session there will be an election of A.E.D. officers for 1954.

"Manufacturers' Day"

The traditional and colorful Installation Luncheon will be held in the Grand Ballroom of the Waldorf immediately following the Wednesday business session. A.E.D. officers for 1954 will be formally inaugurated.

Thursday, closing day of the '54 meeting, has been officially designated as "Manufacturers' Day." A panel composed of prominent manufacturers and distributors will face questions of paramount importance to distributors in the coming year.

Besides the Early Birds' Breakfast and the Installation Luncheon, the social program will also include the President's Reception on Tuesday evening for all members and wives. The Annual Birthday Party, climax of the social events, will be held on Tuesday evening in the Grand Ballroom of the Waldorf Astoria Hotel, immediately following the President's Reception.

• Diversion of state road funds in 1952 to other purposes than road construction "lost" more than 3,600 miles of new highway construction, according to an analysis by the National Highway Users Conference. Twenty-five states diverted funds. Total such "lost" mileage since 1934; 125,000 miles of average new arterial highway.

● Bigger earth and rock yardages are required to build today's wider, leveler arterial roads. (Roads and Streets staff photo.)

YEAR-END

By HAROLD J. McKEEVER, Editor-in-Chief of Roads and Streets

THE year 1953 was a history-maker in the field of highways. It brought a $5.5 billion gross expenditure on the lusty, dynamic highway plant—a new dollar high and up 10 per cent from 1952, marking the 9th year of unbroken upward spiraling since the 1944 wartime low.

It gave birth to a full-fledged toll road boom—$1.4 billion of them under construction, accounting for one dollar in each three of contract awards and one in five spent for road betterment by the states during the year.

The year marked a record for highway contract awards—yet with the stiffest competition in years. And it was an active one in equipment development, with many new models and some entirely new machine types promising higher production and efficiency.

Traffic streams continued to swell, gaining an estimated 5 per cent, with 55 million motor vehicles now on the road—also a new record, bringing new intensification of problems of the highway planner, engineer and maintenance man.

And 1953 will be historic as the one in which the public imagination caught fire over the importance of highway transport and the need to do more about roads, aided by the General Motors essay contest, PAR project and other organized publicity.

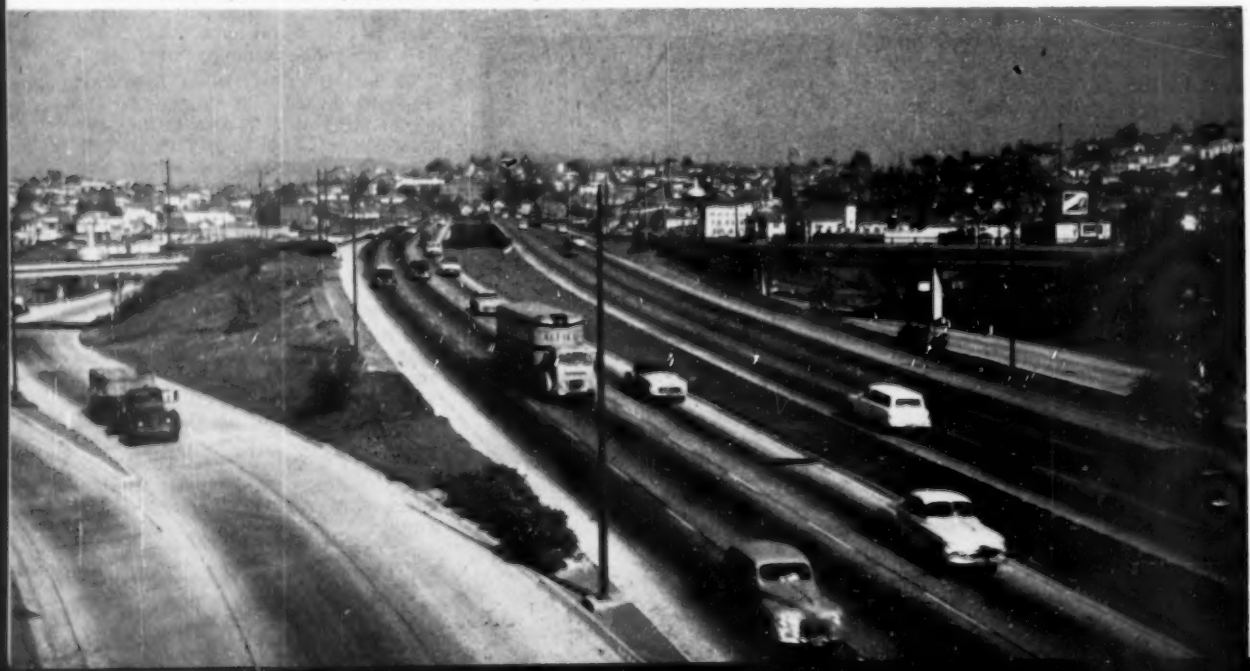
OVER-ALL APPRAISAL

More on some of these points, but first let us make a quick over-all appraisal of our progress. It has been good in 1953, compared with the years immediately past. The showing would have been a reasonably satisfactory one, notes a Bureau of Public Roads spokesman, if traffic streams had remained at prewar levels. As it was, the rate of improvement was much below that required to attain an adequate road system even within a 20-year period. Actual construction accomplishment despite the long rise in dollar volume, is still less than in the best years of the 30's; our tax revenue sources haven't yet been adjusted to offset the dollar devaluation.

According to Richard Zettel, University of California, "constant 1941 dollar" expenditures on roads in 1953 were only $46 per registered vehicle, vs. $73 in 1940.

Engineers estimate that roadbed wear and obsolescence are annually destroying more highway values than

● Los Angeles led among large cities in progress on urban expressways. Hollywood Freeway, here pictured, is part of 100 miles now open to traffic. (Roads and Streets staff photo.)



LOOK AT ROADBUILDING

are being created through new construction and major betterment, despite more intensive maintenance. The cost of correcting deficiencies on the 650,000 miles of main highways is now $40 billion—up $11 billion since 1949.

Expressways are being built in nearly every large city. The states have concentrated with noticeable results on improvement of some of the most heavily traveled inter-city routes, with more 4-lane divided construction than ever before, and many miles of 2-lane highways have been improved to high modern standards. But the rate of accomplishment is such that the motorist and trucker in most communities cannot look forward soon to early relief from congestion, major lessening of inter-city travel time, or sharp reduction in accidents.

Gains in highway construction statistics are due principally to the emergence of toll roads. Contract awards for toll roads during the first 10 months totaled $632 million, compared with $146 million in the entire year 1952. Toll projects hence accounted for 33 per cent of the $1,874,000,000 of highway awards by all state agencies. During the 10 months state highway department awards for non-toll projects were $137 million below the comparable figure for a year ago.

DESIGN TRENDS

Multi-million-dollar urban expressways and other projects involving heavy traffic volumes loomed large during the year. Despite their high per-mile cost, often many times the cost of facilities built in these locations years ago, these projects are revealed as costing less than country roads *per mile per vehicle*. Recent projects represent little that is entirely new in design, notes the Bureau of Public Roads. Rather, they reveal a more widespread adoption of prac-

● Over a thousand bridges are being rushed as part of the construction of major toll turnpikes. This is the Raritan River bridge for New Jersey's $285 million Garden State Parkway, now under way

● The West Virginia Turnpike grading program [29,000,000 cu. yd. moved—see R&S Nov. '53] was a high point in the year's road contract performance. (Roads and Streets staff photo)

tices that have been much-talked-about but less often applied due to inadequacies of laws, pressure of special groups, and lack of funds.

More 2-lane highways are being built on rights of way which permit later dualization. Control of access has been increasingly recognized as a necessary feature for heavily traveled highways, both rural and urban.

Increasing also is the mileage of arterial construction on entirely new location, although this trend is advancing too slowly in engineering opinion. A common practice in such relocation is to relegate the old road to local use.

More arterial mileages are being built to skirt or by-pass wayside towns, rather than pass directly through. This design trend has been hastened by the availability of new data on the affect of such relocations to stimulate rather than reduce local business, and because of the increasingly intolerable congestion brought to small communities by arterial through traffic.

The techniques of improving existing roads to add to their traffic capacity and safety, received further recognition during the year. Cutting down of summits, addition of truck lanes on long grades, and widening coupled with resurfacing and strengthening of roadbeds, are features more often noted. Major relocations across mountain passes, in such states as North Carolina and in the western states, have been accomplished at great per-mile cost.

Whether to put emphasis on new modern highways, on new location, giving users the benefits of latest highway engineering design, or to spend most funds on relatively minor betterments to existing worn and outmoded roads, has emerged as a major policy problem. California, Oregon and Washington are examples of states which have decided to give the public a maximum mileage of the new non-stop, access-controlled type highway, U. S. 99 in each of these states being a chief beneficiary.

Making do with old roads by minor revamping is a more widespread decision in the East where a large mileage of such roads is getting the big end of funds. Massachusetts, Delaware, Maryland, and certain other states, however, are adding rapidly to their mileage of entirely relocated roads. This trend will grow as road funds increase.

CONTRACTING

The year was one of tightening competition for contract jobs in the highway and street field, despite the large volume of work. During the first quarter, according to Bureau of Public Roads figures, an average of 6.8 bids were received per job for state highway offerings, this figure being 5.8 in the second quarter and 6.3 in the third quarter. This compares with 5.0 for 1952, 4.6 for 1951, 6.7 for 1950 and 5.9 for 1949. The past year's bidding pattern was unusually spotty, with an average of as high as 10 or 12 bids received in some states, and occasional jobs attracting 20 or more bids.

The reasons for this competition in a "good" construction year were many. According to an analysis by

The Outlook: $6 Billion for Roads and Streets

But "Deducts" Make Funds Wholly Inadequate

- Federal highway legislation in spotlight as Congress convenes. Strong sentiment for raising federal support from present $575 million yearly to $900 million for 1956-57 biennium.
- Year will be quiet in state legislatures—only four meeting—but many interim studies of highway needs are planned.
- 1954 gross expenditures for roads and streets to reach $6 billion—up another 10 per cent from 1953 under combined impetus of new tax sources, toll road and other bond financing, continued rise in registrations and traffic mileages.
- "Deducts" for maintenance, debt service, engineering, administration and policing will leave $3.5 billion for capital outlay, or less than half the construction rate needed.
- Chief engineering problems: to find enough engineers; to be permitted to re-build more arterial roads on new location, as access controlled projects protected against future roadside encroachments.
- Chief administrative problems: to overhaul archaic highway laws; to find new tax revenues for substantially doubling the rate of road-building.
- Chief long-range objective: to correct $50 billion highway and street deficiencies in foreseeable future through orderly advance planning, financing and programing.

Highway leaders urge annual investment of $10 billion gross with $7.5 billion for construction alone as means of increasing transportation efficiency, stepping up the nation's economy, supporting national defense.

the Associated General Contractors, following an industry survey in September, the factors include (1) increased number and capacity of contractors in the field; (2) increased over-all productivity and efficiency, due to better management, equipment and labor attitudes; (3) more contractors going across state lines for work; (4) new, inexperienced bidders, and bidders entering the road field from defense or housing or other lines; (5) large firms bidding to get work to hold their organizations "in case."

One analyst pointed out that probably at no recent time prior to 1953 could the big letting schedules for the New York Thruway, Ohio Turnpike, and other super projects, have been put on the books at such a rapid-fire pace. Big individual contracts in the $4 to $14 million brackets, accounted for a large part of these projects, which have replaced defense and general heavy work as a major job source for many contractors.

Prices leveled or eased slightly down despite continued high labor and other costs and the outlook is for stability at about present levels. The Composite Mile Index averaged 165.9, 158.5 and 159.4 for the first three quarters of 1953, vs. 162.5 for the entire year 1952. Common excavation was down to $0.37 in the 3rd quarter.

EQUIPMENT

The equipment picture was one of growing competition for sales during 1953, as we receded farther from wartime shortages. Important new models several years in development were introduced, and minor refinements were numerous. More efficient equipment for specific use seems to be the chief trend, resulting in smaller as well as larger units for some work. As an example, one manufacturer introduced a whole new line of loaders, down to "2 bushel" bucket size, while others unfurled heavy-duty crawler tractor models with 2-yard and larger capacity.

Better portability or mobility continues as the trend in aggregate and asphalt plants and other equipment, with emphasis on more production hours per season.

A principal factor in competition among contractors was their ability to turn out larger yardages, due in turn to improved equipment, lifting of controls, disappearance of shortages (some remained in steel and cement), and plentifulness of skilled workers. Earthmoving equipment available today can run circles around wartime models, in many instances, due to such advances as larger tires offering better flotation and less soft-ground traction; more engine capacity per yard of bucket or bed size; better transmissions with as many as 10 gears, shortening hauling cycles; and better controls and increased operator comfort.

MAKE IT BUDGE

WITH A MAN-SIZED *Nudge*

Whether you're trying to budge heavy dirt in Illinois, snow in New England or shale in the Carolinas, you can depend on SHUNK blades.

They're rolled from top-quality steel to our own specifications; economical; designed to take heavy punishment.

For almost a century the name SHUNK has been a byword in all parts of the world to everyone concerned with maintenance and construction blades . . . original equipment manufacturers, contractors, distributors. Let us show you why . . . specify a SHUNK blade for *your* job.

Literature on request.

3,000 DIFFERENT SPECIFICATIONS

Shunk MANUFACTURING COMPANY

In Our 99th Year

BEST BLADES MADE

BUCYRUS, OHIO

● Depletion of quality aggregate sources was of increasing concern in some parts of the country. More mobile, more productive crushing and screening equipment is helping utilize local aggregates to better advantage and cut the per-mile cost of road construction and maintenance

The new competition among the factories extends not only to design but also to education in use and maintenance. Harold Hess, executive vice president of Construction Industry Manufacturers Association, helped spearhead an industry push to bring greater recognition of the seriousness of job delays due to mechanical trouble and to the importance of proper maintenance care.

Equipment sales after years of boom eased off during the second half, reflecting a "marking time" period as contractors consider the outlook, figure ways to make the best use of the machinery on hand, or wait for winter lettings. Industry leaders, however, forecast a sales level in 1954 about equal to the very good over-all volume of 1953, but with individual company sales won through more intensive and intelligent selling.

TOLL ROADS

Toll projects to cost $1,370 million were in the construction state as of October 1. Another $2,445 million in projects were authorized by law but not financed, and $697 million more projects proposed. Facilities costing $660 million were in service.

Leading the field was the New York Thruway, with nearly $400 million in jobs under contract, mostly placed during 1953, with $150 million probably to be paid to contractors in the year. The Ohio Turnpike gave contractors another $200 million in jobs in recent months, and the West Virginia Turnpike was the scene of a million-yard-a-week grading pace, with $49 million in 1953 payments to contractors who cleaned up 29,000,000 cu. yd. of grading mostly since early summer.

Toll road traffic volume made news, with the Pennsylvania Turnpike continuing to set new records, and the New Jersey Turnpike carrying traffic 2½ times the traffic anticipated in advance estimates.

A separate review of toll road activities in sight for 1954 is published in this issue.*

URBAN EXPRESSWAYS

Urban expressways, in most cases primarily under state highway department direction, moved ahead rapidly in some cities, lagged in others due to financing.

In Los Angeles 99.5 miles of freeway segments have been opened to traffic, with $236 million spent or obligated since the war in a long-range 613-mile program for the city and environs.

*See also Roads and Streets for August, September, November, December, 1953, for state-by-state reports on toll road developments.

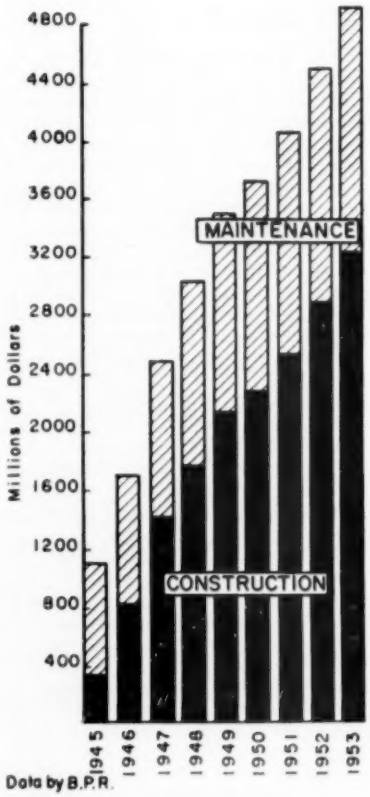
Pittsburgh emerged as a leader with the 27-mile, $100-million transcity Penn-Lincoln Parkway two-thirds built and the remainder under construction. This 4- and 6-lane expressway with fully controlled access will include two tunnels and 53 bridges involving some of the most complex interchanges ever designed.

New York City's expressway system continued to fill out as several important links were opened to traffic. These included a section of the Brooklyn-Queens expressway, the South Street Elevated Highway, and new approach facilities to the George Washington Bridge.

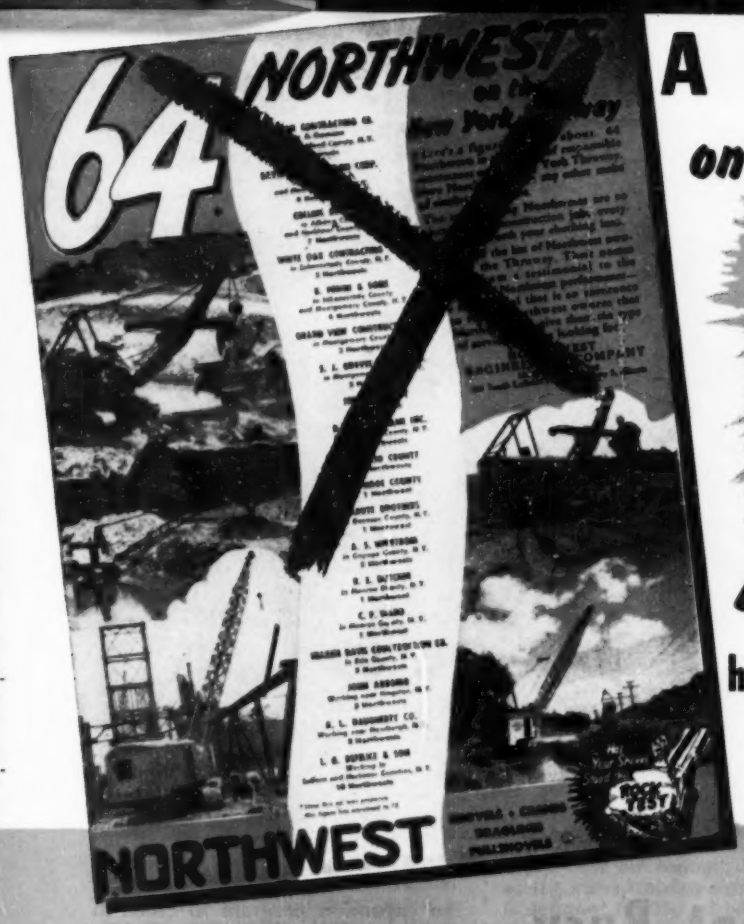
Other cities making progress during the year: Chicago (Lake Shore Drive extension, Congress Street); Seattle (Alaskan Way); Philadelphia (Valley Forge); Detroit (John Lodge and Edsel Ford expressways); Cleveland (Lakeland Freeway); San Francisco (Bay Shore Freeway), with important links in Boston, Jacksonville, Atlanta, Kansas City, Trenton, and in the up-state New York cities, the latter under a state-wide plan.

Broad studies of the over-all transportation problems of cities are gaining headway, as a necessary step toward solving the traffic ills of our

(Continued on page 62)



● How construction and maintenance expenditures have climbed yearly since the wartime low. Chart shows these two items only



A NEW NUMBER

on the New York Thruway

81

NORTHWESTS

help push 427 miles of Better Driving

Figure it up! That averages a Northwest every 6 miles across the full length of this tremendous job!

Check over the names of the contractors. You will recognize them as being from far and wide—New York, Pennsylvania, Connecticut, Massachusetts, Indiana, Missouri, Illinois, Minnesota—all Northwest users of long standing. In fact, this group of contractors has, over the years, bought over 200 Northwests.

When you come to purchase your next shovel, crane, dragline, pullshovel or truck crane, remember these figures. It comprises a testimonial to performance and satisfaction that no other manufacturer of similar equipment can offer.

NORTHWEST
ENGINEERING COMPANY
1504 Field Building, 135 South La Salle Street
Chicago 3, Illinois

MT. VERNON CONTRACTING CO.
Healy & Gamino
Working in Rockland County, N. Y.
9 Northwests

SAVIN CONSTRUCTION CORP.
in Green County and Madison County, N. Y.
4 Northwests

COLLINS BROTHERS
in Albany County and Herkimer County, N. Y.
7 Northwests

D. V. FRIONE, INC.
in Albany County, N. Y.
3 Northwests

WHITE OAK CONTRACTING CO.
in Schenectady County, N. Y.
2 Northwests

ARCOLE MIDWEST CORPORATION
in Schenectady County, N. Y.
2 Northwests

B. PERINI & SONS
in Schenectady County and Montgomery County, N. Y.
4 Northwests

GRAND VIEW CONSTRUCTION CO.
in Montgomery County, N. Y.
2 Northwests

S. J. GROVES & SONS CO.
in Montgomery County, N. Y.
2 Northwests

SENECA COUNTY
1 Northwest

D. W. WINKLEMAN INC.
in Onondaga County, N. Y.
4 Northwests

ONTARIO COUNTY
2 Northwests

MONROE COUNTY
1 Northwest

ARUTE BROTHERS
in Genesee County, N. Y.
1 Northwest

A. S. WIKSTROM
in Cayuga County, N. Y.
2 Northwests

R. E. DUTCHER
in Monroe County, N. Y.
1 Northwest

C. P. WARD
in Monroe County, N. Y.
1 Northwest

FRAZIER DAVIS CONSTRUCTION CO.
in Erie County, N. Y.
5 Northwests

L. G. DEFELICE & SON
Working in Suffern and Herkimer Counties, N. Y.
10 Northwests

WALSH CONSTRUCTION CO. & C. J. LANGENFELDER & SON
in Rockland County, N. Y.
9 Northwests

JOHN ARBORIO
Working near Kingston, N. Y.
4 Northwests

A. L. DAUGHERTY CO.
Working near Newburgh, N. Y.
5 Northwests

NORTHWEST

CRAWLER and TRUCK MOUNTED SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

10 Big 'Dozers Kept Busy On McGuire Air Base Job!

Yonkers Contracting Co. Equips HD-20s with GAR WOOD Cable 'Dozers

With over 4,000,000 yds. of earth to be handled in an 8 month period, Yonkers Contracting Co. assembled a fleet of high capacity equipment at the McGuire Air Force Base near Wrightstown, N. J.

Included in the equipment first moved to the job were 10 Allis-Chalmers HD-20 tractors equipped with Gar Wood cable controlled TipDozers. Most of the tractors were also fitted with Gar Wood double-drum cable control units to permit immediate use with scrapers.

In addition to rough grading in an area of approximately 1,000 acres, the contract requires clearing of some 450 acres as well as all drainage facilities within the job confines.

Rough grading is a balanced operation of cut and fill with long, shallow cuts of approx. 12 ft. maximum depth. In the wet, sandy soil condition, the design of Gar Wood blades has helped to easily roll material — thus permitting maximum utilization of tractor power.

The accuracy possible with Gar Wood cable control units has also permitted rough grading to specifications with a minimum number of passes — effecting measurable savings in job time and reduction of wear and tear on equipment.

Work now underway is part of an expansion program to establish McGuire as the Eastern aerial port of embarcation. Total contracts will exceed $40,000,000.

Gar Wood Cable Control Units Used . .

The model 281 Gar Wood cable control units used on the HD-20s are of planetary design for smoothest possible operation. Units have 60% more cable capacity than any other P.C.U. now made with only three points of adjustment . . . The Gar Wood line includes 'dozers in 15 models for both cable and hydraulic operation — specifically designed for all A-C tractors.

GAR WOOD INDUSTRIES, INC.

MATTOON DIVISION • EXECUTIVE OFFICES • WAYNE, MICHIGAN

Construction Equipment: Dozers, Excavators, Ditchers, Scrapers, Spreaders, Finegraders. *Truck Equipment:* Dump Truck Bodies & Hoists, Winches & Cranes.

M-4002N

Joints Sawed in POURING SEQUENCE for Concrete Apron

★ Sample of joint showing how shrinkage crack has opened up at controlled location

Notes on design and construction of 800 x 4,000 ft. apron pavement at Davis-Monthan Air Force Base, Tucson, Arizona. Sawing costs reduced by delayed sawing and special equipment cracking entirely controlled by good timing control.

LOW joint sawing costs and virtually complete elimination of uncontrolled shrinkage cracks, are among the results reported at Davis-Monthan Air Force Base, Tucson, where a large heavy-duty apron is nearing completion. Morrison-Knudsen Co., Inc., & Ross Westbrook have the contract for this $2,370,000 project which involves grading, drainage, paving and ducts for an apron approximately 800 ft. wide and 4,000 to 4,200 ft. long. About 153,000 cu. yd. of concrete will be required.

The 15 in. thick concrete pavement is designed in 25 ft. lanes which are keyed but not tied except around the periphery of the apron. The outer lane joint on either side of the apron is tied with ⅝ x 32 in. standard tie bar assemblies. The 25-ft. end panels of each lane are keyed and tied across dummy joints with ⅝ x 32 in. reinforcing bars and dowels 1¼ x 20 in. smooth are placed at construction joints. No distributed reinforcement is specified.

The concrete is a 6½-sack mix with 4 per cent air content, using Darex as the air-entraining agent. Concrete is designed for 550 psi beam strength at 14 days. The aggregate is an alluvial, water-rounded material, the course aggregate being about 30 per cent crushed. The Los Angeles Rattler loss is approximately 20%.

The contractor's equipment included a Koehring 34-E dual-drum paver; White trucks with compartments for five 1.385 cu. yd. batches; a Blaw-Knox spreader with Viber vibrating units mounted in the rear; a special finisher; a 2-man longitudinal bull float; a Jointmaster sawing machine; and curing with Sealtex white-pigmented compound under a subcontract with Techkote Company. Progress was at the average rate of about 1,200 cu. yd. per day of 10 hours, the work being hampered at times by very high wind and dust conditions.

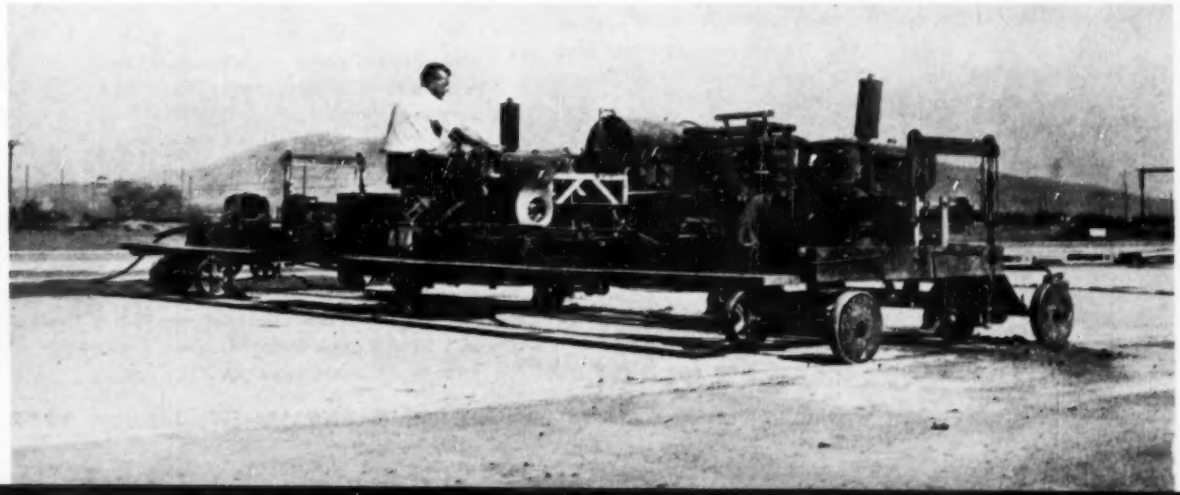
Full depth internal vibration permitted the use of a relatively dry mix which could be finished immediately, in addition to the other advantages of higher strength, greater uniformity, etc.

A Tournacrane was used with a D8 Caterpillar tractor to lift formriding units from one lane to another.

The sandy loam was prepared with the usual tractors, pans and motor grader, and a 50-ton Southwest compactor used to secure final densities.

The finishing machine is an experimental unit under development by Hurst Lewis, of Pasadena.* The machine has two transverse oscillating screeds in conjunction with a wheel base more than three times as long as that of the conventional finisher seen in the East. As ultimately used, it would eliminate the need for a longitudinal bull float. A feature is

★ Four-blade Jointmaster sawing machine used at Davis-Monthan



mobile concrete mix plant on rubber

Koehring 16-E *twinbatch* rides on pneumatic tires . . . works, travels on or off pavement . . . makes self-powered moves at 9 m.p.h. Its rubber-tired mobility increases productive work-time. Its high elevating boom discharges into overhead hoppers . . . pours concrete for buildings, pilings, culverts . . . or batches into trucks. Bucket on 60° elevating boom discharges at a height of 21 feet (higher with special boom). Boom also swings in a 160° arc . . . speeds pouring of floors, footings, highway and airport strips.

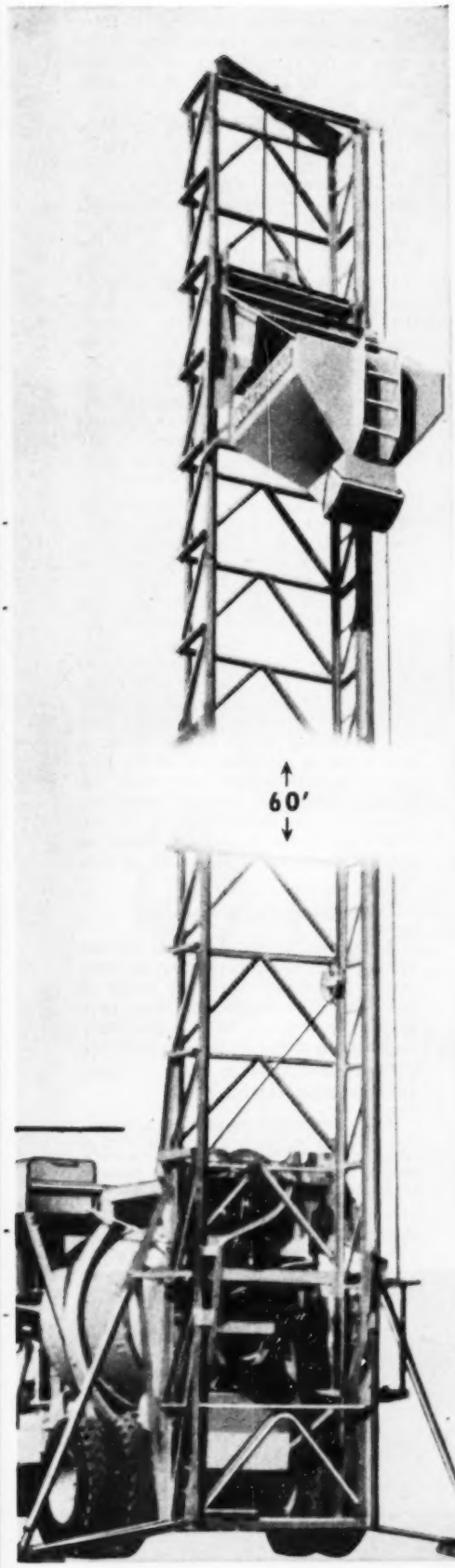
This versatile 16-E easily mixes and distributes over 50 cu. yds. per hour. 7-second skip hoist, split-second Autocycle mixing, and vertical syphon-type water tank all assure consistent, maximum-strength concrete at top mixing speeds. Get all the facts from your Koehring distributor . . . or write *Koehring Co., Milwaukee 16, Wis.*

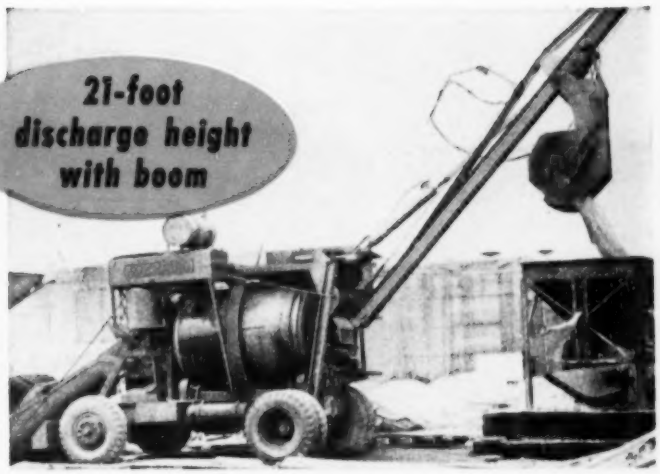
(Subsidiaries: **JOHNSON • PARSONS • KWIK-MIX)**

KOEHRING 16-E *twinbatch*®

48½-foot discharge height with tower

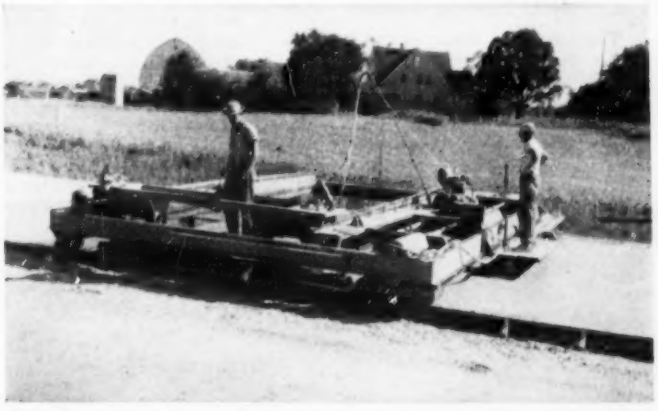
On the Koehring 16-E, the elevating boom is interchangeable with a 40 or 60-foot tower. This gives discharge heights up to 48½ feet for pouring high columns, piers, decks and upper floors. 21½-cu. ft. hoist bucket discharges automatically into 40 cu. ft. overhead hopper. Hopper is easily positioned (at 6-inch intervals) anywhere along face of tower. Tower is raised . . . or safely lowered into horizontal carrying position . . . by the same hydraulic ram used on the elevating boom. K436



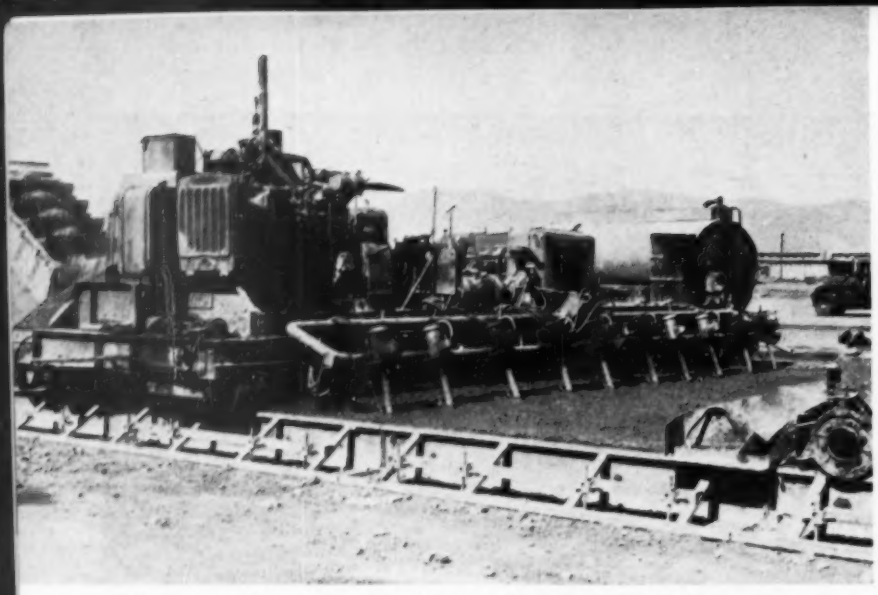


Koehring 16-E *twinbatch* is never "grounded". Bucket discharges anywhere along 25-foot elevating boom. Clamshell door on 24-cu. ft. bucket is hydraulically operated, opens or closes at any time for controlled discharge.

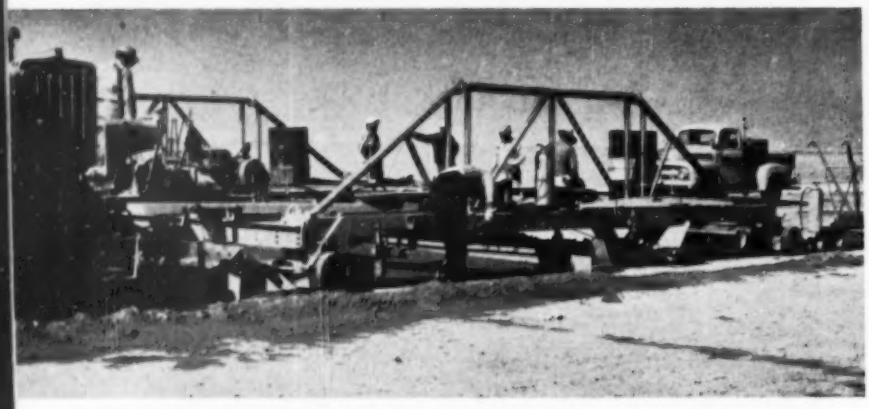
On large-volume paving, Koehring's big 34-E *twinbatch* hits top output of 86.7 batches an hour (60-sec. mixing time). This reserve capacity offsets normal job delays, assures an average of 50 batches hourly, 8 hours a day, at no increase in batching, hauling or finishing equipment.



"Timely", precision-finishing is important on any paving job. Koehring Longitudinal Finisher operates at almost twice the speed of a 34-E paver, produces mechanically-accurate concrete slabs, 8-to-30-ft. wide, uniform crown transitions.



★ The 15-in. depth concrete was vibrated by a Viber unit mounted on the rear of the spreader



★ Experimental long-wheel-base finisher—see text for details

the spring-suspended rear screed designed to improve the final strike-off. This is followed in this instance with the specified longitudinal bull float. A mechanical belting machine is then backed up to provide the final surface.

Joint Sawing Details

The joints are being sawed by Concrete Sawing Equipment Co. under subcontract by a Jointmaster unit which rides the forms. Four 12-in. saws, mounted in a single traveling frame, complete a joint in 6¼ ft. of saw travel. Concrete Sawing, Inc., the manufacturer, cooperated with the contractor and engineers to determine the best and most economical method of cutting joints for the conditions.

In contrast with a commonly specified procedure of cutting control joints as early as possible, and sawing intervening joints later, the method used here has been to cut all joints in straightforward 1-2-3-4 order of pouring. During the Arizona midsummer heat, when paving was started, the joints were cut at from 7 to 9 hours, the sawing thus beginning in the early afternoon and continuing until about midnight for each day's pour.

As the work progressed, the time interval after pouring was gradually extended, in an effort to determine by actual experience how much lag could be permitted without the development of uncontrolled shrinkage cracks. By mid-October—aided by the cooling weather—the time lag had been increased to a maximum of 14 hours, and 10 miles of 25 ft. lane had been sawed before the appearance of the first minor crack outside of a joint location. Only two partial-width cracks had occurred, and the engineers at that time approved the continuation of sawing at an interval not exceeding about 14 hours. By late November, the sawing had been dropped back to as long as 26 hours.

The contractors have benefitted by the delayed sawing, because of the now-familiar fact that blade wear is greatly reduced when the concrete has had additional time to harden; because green concrete (7 to 9 hours) has a tendency to tear under the blade teeth, the easily loosened aggregate particles contributing to blade wear as well as causing occasional spalling of joint edges. The engineers on this job have found that the governing factor of the life of a saw blade is the hardness of the free coarse sand that tears loose from the mass during the sawing operation. Also that in pavements of 12 in. depth or thicker it is much easier to control shrinkage cracks than in thin slabs.

Sawing Costs Reduced

A figure for sawing cost of 8.6 cents per inch-depth per foot of joint was reported for the early stage of the job. This figure has been progressively reduced as the operators learned the fine points of sawing for

(Text continues on page 44; pictures on page 42).

*New California State highway specifications require a finishing machine with a wheel base not less than 25 ft. with a screed suspended approximately midway between.

★ Showing dowel bars at dummy joints nearest lane ends

★ Sawed joints were immediately filled with dust to protect joint edges

FASTEST, EASIEST WAY TO LOAD MATERIAL FROM STOCK PILE INTO TRUCKS

BARBER-GREENE BUCKET LOADERS

No other machine, no other method can equal the speed and efficiency of Barber-Greene Bucket Loaders in loading sand, gravel, and other similar bulk materials from stock piles and storage areas into trucks. At rates up to 3 cubic yards per minute, these loaders dig, lift and convey bulk material in one continuous high capacity flow, virtually eliminating truck waiting and driver waiting time. Simple to operate, easy to understand. The truck driver can operate the loader to load his own truck. Backed by over 1,000,000,000 yards of material handled by Barber-Greene Loaders, they represent the ultimate in low-cost loading efficiency.

A TYPE THAT WILL DO YOUR JOB BEST

MODEL 543

This self-propelled loader is mounted on a tractor-type chassis and pneumatic tires for traveling from job to job at rates up to 15 m.p.h. Equipped with a hydraulic swivel conveyor, it has the reach to load highest trucks, long trucks and trailers, and trim the load to full capacity every time. Capacity—3 cubic yards per minute. Easily converted for loading coal or snow.

Send for catalogs!

Complete and detailed information on the Model 543 and 82A is contained in individual catalogs available at your request. Ask your Barber-Greene Distributor or write directly to the address below.

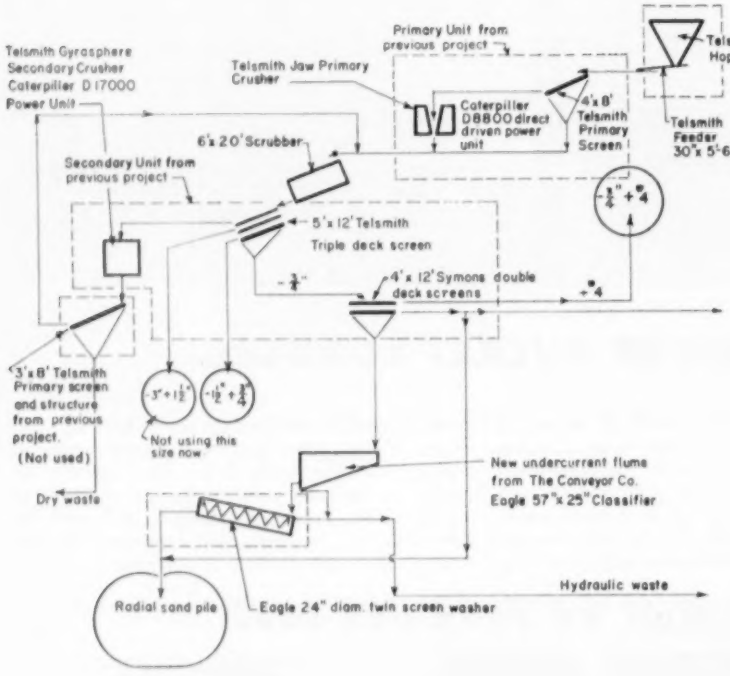
MODEL 82A

This crawler-mounted, 3 cubic-yard per-minute Bucket Loader has the stability so often necessary in typical truck loading operations—in pits, on soft or rocky ground, etc. Built for heavy, continuous operations, it is economical enough to justify itself in intermittent service. Complete accessories are available, including single and double deck vibrating screens for loading, screening and scalping simultaneously.

Barber-Greene

Aurora, Illinois, U. S. A.

★ (At Left): White trucks with 5-compartment Heil bodies delivered batched materials to the paver. (At Right): One Koehring 34E dual-drum paver handled the apron job


Telsmith Gyrasphere Secondary Crusher Caterpillar D 17000 Power Unit
Primary Unit from previous project
Telsmith Jaw Primary Crusher
Caterpillar D8800 direct driven power unit
4'x 8' Telsmith Primary Screen
Telsmith Hopper
Telsmith Feeder 30"x 5'-6"
6'x 20' Scrubber
Secondary Unit from previous project
5'x 12' Telsmith Triple deck screen
4'x 12' Symons double deck screens
3'x 8' Telsmith Primary screen and structure from previous project. (Not used)
Dry waste
Not using this size now
New undercurrent flume from The Conveyor Co.
Eagle 57"x 25" Classifier
Hydraulic waste
Radial sand pile
Eagle 24" diam. twin screen washer

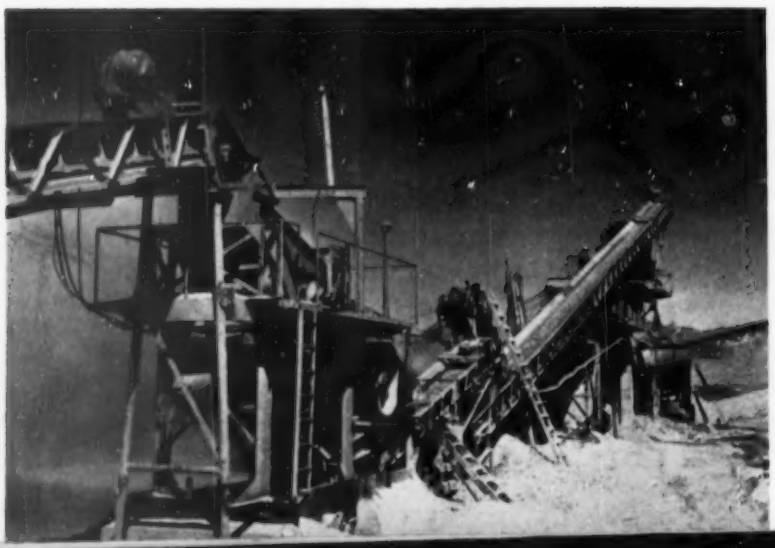
★ The contractor's aggregate plant was composed partly of units taken from a previous job, as noted in this sketch. This set-up designed to meet various possible requirements of the engineers

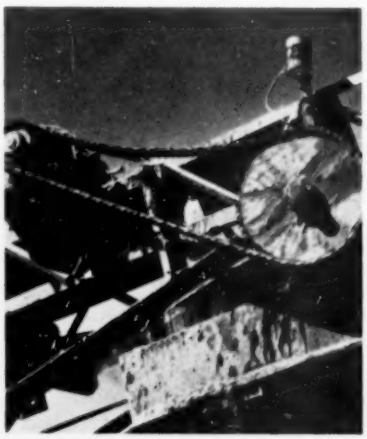
Plant of Morrison-Knudsen Co., Inc., and R. A. Westbrook for crushing and screening aggregates for base and paving. Two 75 kw, one 125 kw and one 50 kw diesel power units used in addition to those noted. These four units, under one roof, furnished electric power for motors on all belt units, screens, classifier and feeder.

Also a D8800 and a D13000 unit on two well pumps, for water for classifier, a Peerless and a Byron Jackson pump delivering 1,000 gpm from distant well into storage pond and into the plant.

A Northwest 95 dragline loaded aggregates into White dump trucks with Heil bodies for delivery to the project. Two D8s and one Athey loader on stockpile work. The batch plant was a Conveyco 4-bin, 160-ton-per-hour assembly.

(See page 44 for continuation of article on Davis-Monthan paving job)



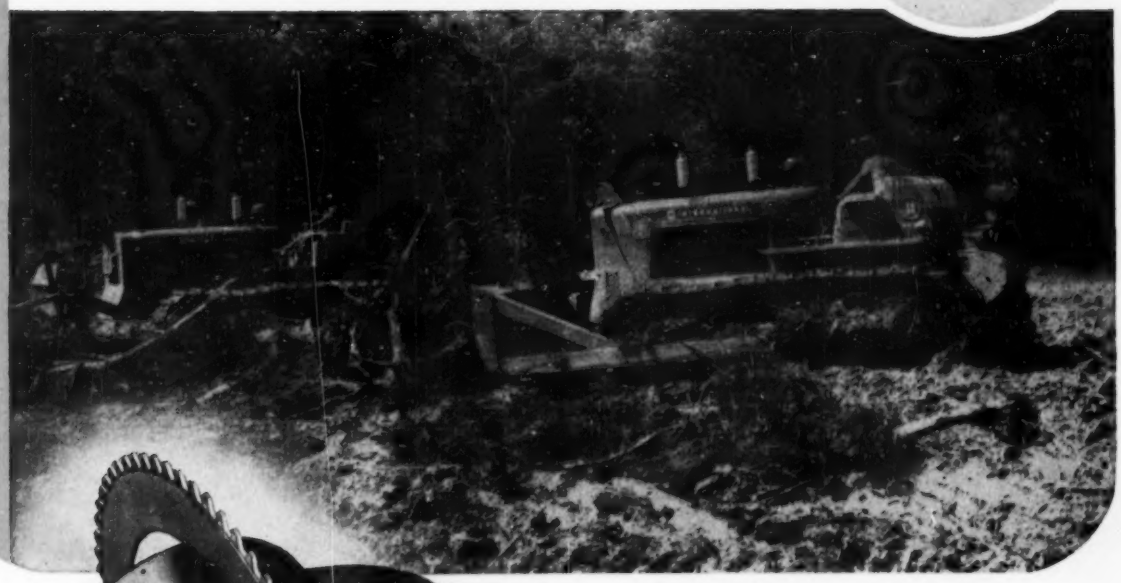


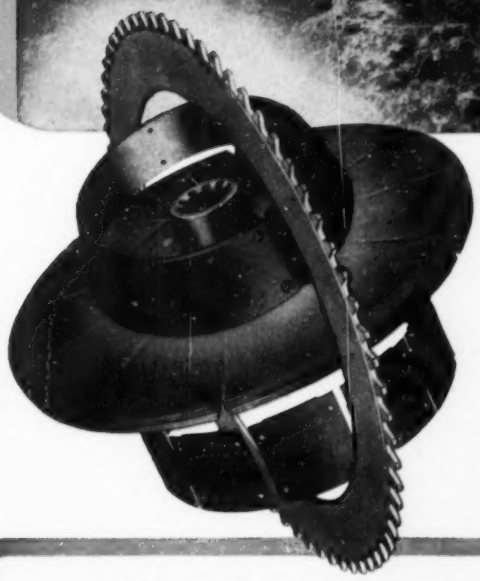
★ How one of the chain sprockets was kept oiled under dusty conditions

★ Looking along the primary and secondary crusher line of the set-up for paving Davis-Monthan air force base

"Velvetouch is the only friction material to withstand ... constant hard useage"

George Loper





Keeping approximately 600 pieces of construction equipment out of the repair shop and on the job, is a mighty important responsibility. But George Loper, Equipment Superintendent for James D. Morrissey, Inc., Philadelphia, takes it in stride . . . thanks to Velvetouch all-metal clutch plates, facings and brake linings.

"Since changing to Velvetouch frictions," Mr. Loper writes, "we find our down-time reserved to periodic overhauls."

You also, will find that Velvetouch minimizes field break-downs. Why? Because it's all-metal! Because it's heavy-duty built for continuous operation. Write for details today.

THE S. K. WELLMAN CO. SALES OFFICES AND WAREHOUSES

* ATLANTA — 119 14th St., N. E., Atlanta 5, Georgia

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* SAN FRANCISCO — 424 Bryant Street, San Francisco 7, Calif.

* CHICAGO — 1500 South Western Ave., Chicago 8, Illinois

* LOS ANGELES — 1110 South Hope St., Los Angeles 15, Cal.

* TORONTO, ONTARIO — The S. K. Wellman Co. of Canada, Ltd., 208 Bartley Drive, O'Connor Depot

* CLEVELAND — 200 Egbert Rd., Bedford, Ohio

* PHILADELPHIA — 1545 West Belfield Ave., Philadelphia 41, Pa.

** WASHINGTON — 1101 Vermont Ave., N. W., Washington 5, D. C.

* DALLAS — 3407 Main Street, Dallas 26, Texas

* PORTLAND — 638 N. W. 18th Ave., Portland 9, Oregon

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* SALES OFFICE AND WAREHOUSE ** SALES OFFICE

Velvetouch

The S. K. Wellman Co.
200 Egbert Rd. • Bedford, Ohio

★ Four diesel generator units furnished power for electric-motor-driven belts, screens and other units except crushers

★ Water for the classifier was pumped from a distant well to the pond shown, and thence into the plant

★ Aggregate was loaded for hauling to the batch plant by an Athey "over the head" loader"

Joint-sawing methods

(Continued from pages 40 and 42)

the particular concrete and climatic conditions, the current cost being 6.4 cents per inch-depth per foot. A set of four blades, tipped with industrial diamonds, was lasting an average of 75 joints or 1875 ft. of joint, or about 468 ft. per blade. Some sets of blades have cut as many as 126 joints.

Joints are immediately filled with fine dry dust, mounded, to protect against edge breaks under tires of batch trucks and other vehicles. The contractor plans to fill joints with a jet fuel resistant sealing compound, using a method of application not determined at this writing.

The Davis-Monthan project is under the Corps of Engineers, Los Angeles District, Col. Arthur H. Frye, Jr., District Engineering; Gordon Lilly, Project Engineer; Harry Althus, Chief Inspector. Oliver Pope and John West are Project Manager and Project Engineer respectively for Morrison-Knudsen Co., Inc. & Ross Westbrook.

Steel Institute elects

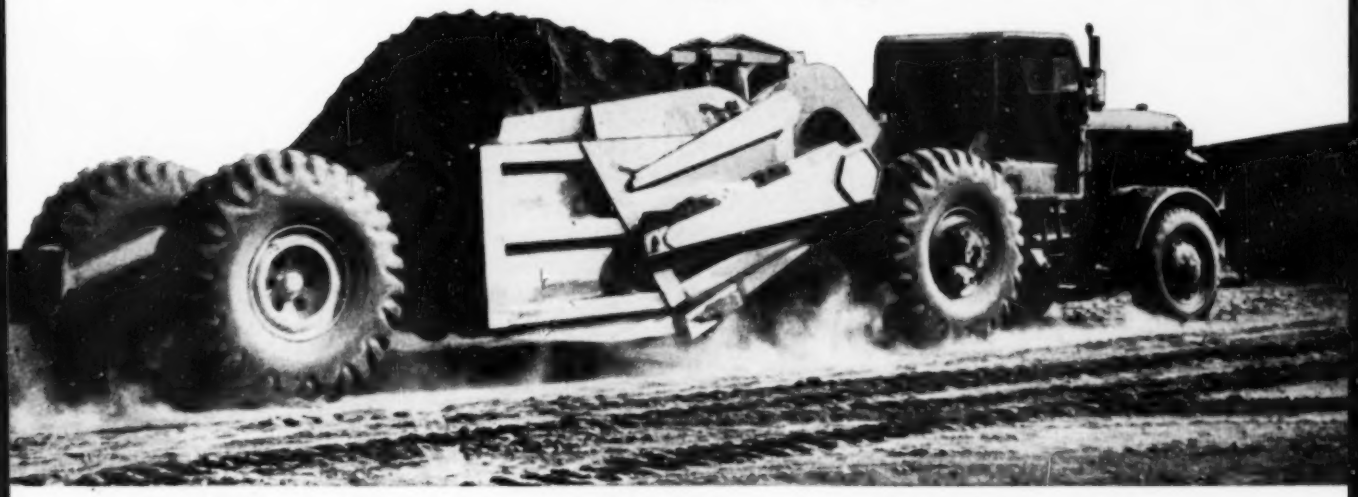
John E. Jackson, president of Pittsburgh-Des Moines Steel Company, Pittsburgh, Pa., was re-elected president of the American Institute of Steel Construction for 1954.

Other officers, all re-elected, are Earle V. Grover, Apex Steel Corp., Ltd., Los Angeles, Calif., first vice president; N. P. Hayes, Carolina Steel & Iron Co., Greensboro, N. C., second vice president; James M. Straub, Fort Pitt Bridge Works, Pittsburgh, Pa., treasurer; M. Harvey Smedley, secretary, and L. Abbett Post, executive vice president.

Directors elected include one new and nine re-elected directors were named: Laurence McKinney, president of James McKinney & Sons, Inc. Albany, N. Y. (new); B. O. Bach, Manager of Sales, Fabricated Steel Construction, Bethlehem Steel Co.; B. E. Bushnell, president, Bushnell Steel Companies; Neil G. Lilley, vice president, Kansas City Structural Steel Co.; T. R. Mullen, president, Lehigh Structural Steel Co.; P. M. Jacobsen, vice president, Pacific Car and Foundry Co.; F. E. Owen, president, Paxton & Vierling Iron Works; J. E. Jackson, president, Pittsburgh-Des Moines Steel Co.; L. J. Bodeewes, manager, Structural Fabricating Department, Joseph T. Ryerson & Son, Inc., and L. J. Knapp, vice president and secretary, Whitehead & Kales Company.

Johnson Appointed District Sales Manager. Charley H. Johnson, Worcester, Mass., has been appointed district sales manager in the New England and New York territory for Sherman Products, Inc., Royal Oak, Mich.

How big is a scraper payload?



Because there are several ways to figure equipment capacity, it's mighty important that payload ratings are compared on the same basis. For example, if you use the struck figure for one unit and the heaped capacity for others in making a production estimate, the result can mean an unprofitable bid and higher costs per yard moved.

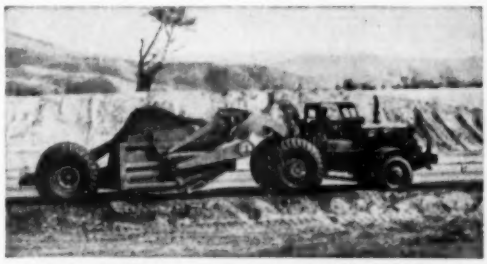
And heaped capacity ratings can be misleading too, because just how high is a heap? Some manufacturers use a heaped figure based on a 1:1 slope while others prefer a more conservative and practical rating of 3:1 slope. Heaped loads can vary by several cubic yards depending on the material, method of loading and hauling conditions. For example, the Euclid Scraper carries 15.5 cu. yds. with a level load, 18 cu. yds. with load heaped to 3:1 slope and 21 cu. yds. at 1:1 slope.

When you're in the market for scrapers to supplement or replace your present equipment, be sure to check struck capacity and other specifications such as engine horsepower, loaded travel speed, scraper operating controls and hourly cost and production data.

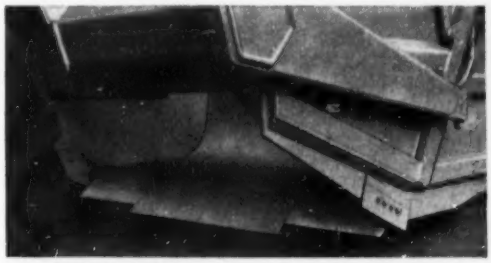
How big is a scraper payload? You can't tell how much dirt is in the bowl just by looking—it's the pounds of pay dirt that tell the story. By actual scale weight, "Eucs" carry more pounds of payload than scrapers of comparable size because the design of the low, wide bowl provides good loading action and exceptional compaction.

You'll find there are good reasons why "Euc" scrapers outperform all others of comparable size. A Euclid distributor near you will be glad to supply all the facts—without any obligation, of course.

EUCLID DIVISION
GENERAL MOTORS CORPORATION, CLEVELAND 17, OHIO



LEVER ACTION is an exclusive Euclid development that eliminates all but 13 ft. of cable . . . no more cable replacement expense or down time due to cable breakage. All four hydraulic hoists that operate bowl, apron and ejector are interchangeable.



CUTTING BLADE consists of 4 sections, each interchangeable and reversible. This Euclid design permits easy adjustment to provide blade arrangements that are most efficient for loading any type of material from loose sand and top soil to heavy clay and shale.

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

GM GENERAL MOTORS

Buy 'em by the YARD

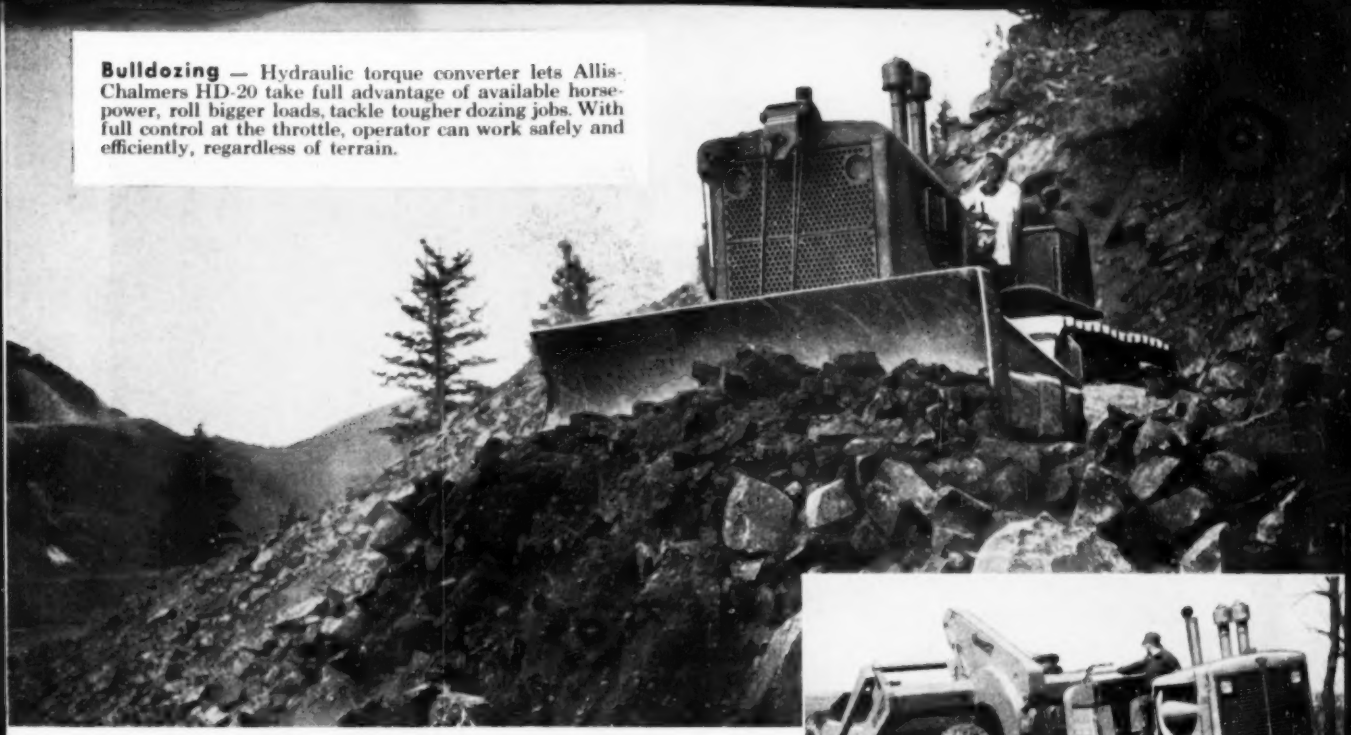
When you buy bulldozing or grade-building equipment, you buy for one purpose: *to move the most yardage possible in the least amount of time.*

If you're in the market for new equipment, watch a Baker Bulldozer or Gradebuilder at work . . . and think about it in terms of *yardage.* Study its powerful, effective Roll-Action that boils the material *higher* . . . its Positive Down-Pressure that penetrates hard surface quickly and *stays down* without "suck-in" . . . its Direct Lift with linkage *minimized* to reduce friction and power loss . . . and its Fingertip Control that gives operators *easier, more accurate* command of their work. And while you're there, look closely at the simple, rugged design of a Baker Blade — built for longer wear-life with lowest possible maintenance.

After you've checked every profit-making feature on a Baker Blade, think about it in relation to *your* jobs . . . and you'll see why Baker Blades are bought for their ability to deliver the main objective: *yardage.*

Your Baker, A-C Dealer will be glad to demonstrate a Baker-equipped A-C Tractor working in your area.

THE BAKER MANUFACTURING COMPANY
SPRINGFIELD, ILLINOIS



Bulldozing — Hydraulic torque converter lets Allis-Chalmers HD-20 take full advantage of available horsepower, roll bigger loads, tackle tougher dozing jobs. With full control at the throttle, operator can work safely and efficiently, regardless of terrain.

AN ALLIS-CHALMERS REPORT

How hydraulic torque converter drive improves big tractor performance — increases job output

With a two-range transmission and hydraulic torque converter, the Allis-Chalmers HD-20 is the only crawler tractor that is capable of exerting maximum drawbar pull *at all times* . . . under all load and terrain conditions . . . without gear-shift guesswork.

Whatever the job, the operator need merely make contact with the load and then open the throttle. As the load requirements change, the hydraulic torque converter *automatically* matches the conditions with exactly the right combination of speed and pull.

This eliminates most shifting . . . leads to far more work done in a continuous work cycle . . . far longer equipment life.

• • •

Hydraulic torque converter drive, exclusive as standard equipment with Allis-Chalmers, is just one of many reasons why the HD-20 assures you higher output with less upkeep. Your nearby Allis-Chalmers dealer invites you to get the full story . . . and to see it in action.

WEIGHT — 41,000 LB. • 175 NET HP. AT FLYWHEEL

ALLIS-CHALMERS
TRACTOR DIVISION — MILWAUKEE 1, U. S. A.

Pulling — Hydraulic torque converter drive actually multiplies torque up to four and one-half times . . . develops tremendous drawbar pull to start the load smoothly . . . and automatically accelerates to the highest speed that conditions permit, in either high or low range.

Pushing — Operator just makes contact, then opens the throttle and relaxes. The HD-20 automatically matches speed to that of pushed equipment, maintains steady contact while loading, sends load off to the fill at higher speed.

Digging and Loading — With the HD-20G, the operator crowds surely and steadily, using only throttle and bucket levers. With full horsepower always available even at creeping speed, he can work effectively in mud, on hillsides or edges of banks.

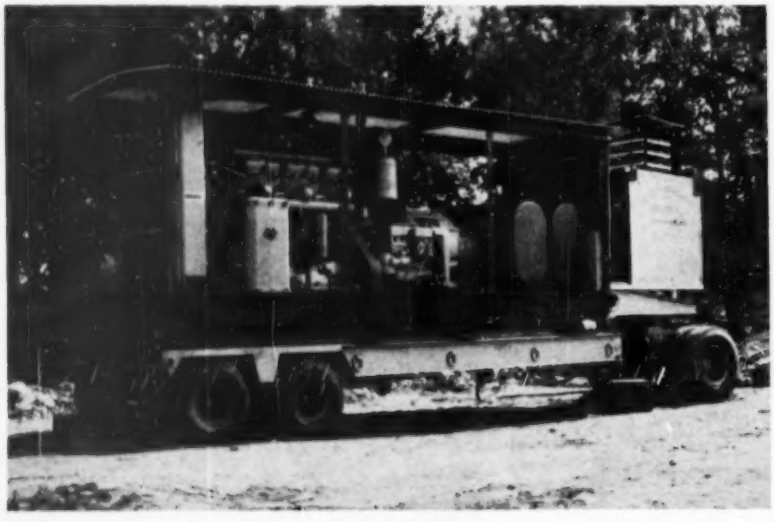
★ Five-yard Bucyrus-Erie shovel of Geo. M. Brewster & Son, Inc., working from mobile generator

MOBILE GENERATORS Power 5-yd. Shovel

SOLID rock—9.29 miles of it—faced the road construction firm of George M. Brewster & Son, Inc., when it contracted to build a section of the New York Thruway in the Catskill Mountain-Hudson river area.

Since something more than ordinary seemed needed for such a job, the firm purchased a Bucyrus-Erie 120B electric 5-yard shovel on an experimental basis, and, since there was no supply of electric current available, the company also purchased an especially designed mobile Caterpillar D397 electric set to power it.

The combination got an enthusiastic "OK" from the contractors, who have bought another identical shovel and diesel electric set. The units are operating this winter at opposite ends of the project. The accompanying photos show something of how the necessary transformers are mounted on the trailer with the generator, and how skid-mounted towers are used to keep the cable up in the clear.



★ Caterpillar diesel generator is mounted on rubber-tired tow-rig, complete with fuel tanks and (up front) transformers

Torrence heads Virginia Road Builders

Officers and directors of the Virginia Road Builders Association for 1954:

President, A. B. Torrence, A. B. Torrence and Company, Elkton, Va.; Vice-President, W. Hunter Scott, President and Treasurer, W. H. Scott, Inc., Franklin, Va.; Secretary-Treasurer, D. E. Ball, Chairman, Northern Virginia Construction Company, Alexandria, Va.; Archer B. Gay continues as Engineer-Director.

More Toll Road "Plus" Signs

TOLL highway financing and construction will reach a new peak in 1954, with an increasing number of states figuring in such developments and feasibility studies of possible future projects, analysis of reports from state capitals indicates.

Among the latest current and prospective developments, on a state-by-state basis, are the following:

• **ARKANSAS:** A study of the possibility of contributing to a solution of the state's highway financing problems through toll roads is being conducted by the State Legislative Council. The study was ordered by the 1953 legislature after Governor Cherry vetoed a toll road enabling act.

• **CONNECTICUT:** Plans have been announced by Governor Lodge for the sale early next year of $50,000,000 to $60,000,000 in bonds as part of the financing of the 125-mile toll highway being constructed across eastern Connecticut, from the New York line near Greenwich to the Rhode Island line at Killingly. The entire project is expected to cost more than $200,000,000. The bonds will be secured by gasoline taxes as well as toll receipts.

• **FLORIDA:** A delay of two or three months in Florida toll road plans was expected to result from Acting Governor Johns' appointment of a new State Turnpike Authority membership. The acting governor has asserted, however, that he wants to proceed with construction of a "bob-tailed" toll highway extending some 103 miles northward from the Miami area. Engineers have estimated such a road could be feasibly constructed with a $62,000,000 bond issue.

• **GEORGIA:** A bill to authorize a cross-state, $225,000,000 toll superhighway was pending at this writing in the Georgia legislature, with the backing of Governor Talmadge. The measure would create a new Georgia Bridge and Turnpike Authority, which could finance and construct the much-discussed Georgia section of a projected north-south toll superhighway, as well as other toll road and bridge projects.

A provision of the Georgia bill stipulated, however, that the proposed authority could join with representatives of other states in building the contemplated state-long, four-line toll road only "upon a formal proclamation by the governor that such a project is feasible and is necessary to avert the loss of tourist traffic" through the state.

The Georgia bill set no actual route for the road, which would run some 300 miles, roughly from Cartersville to a point below Valdosta. Some 80 miles of four-lane road already is authorized under construction or already completed between Cartersville and Griffin.

• **ILLINOIS:** Chairman Evan Howell of the Illinois Toll Roads Commission has revealed plans for completion within two years of a toll road in the Chicago area to tie in with a projected Indiana link in a toll road system to the Eastern seaboard. He also announced that a court test would be made of the constitutionality of the state's new toll road enabling act.

• **INDIANA:** State Toll Road Commission announced a $280,000,000 revenue bond issue to finance construction of the projected toll superhighway across northern Indiana would be marketed Dec. 17. Linking with the toll superhighway now being constructed across northern Ohio, the Indiana turnpike will run 150 miles to the Indiana-Illinois line near Hammond.

• **KANSAS:** A preliminary report on the feasibility of a Kansas City-Topeka-Wichita toll highway was expected to be ready by mid-January, the Kansas Turnpike Commission was informed by its consulting engineers, Coverdale & Colpitts of New York and Howard, Needles, Tammen & Bergendoff of Kansas City.

• **KENTUCKY:** Plans for the financing and construction of a $30,000,000 toll highway between Louisville and Elizabethtown are being deferred pending the outcome of litigation to test the validity of the 1950 state toll road enabling act. Hopes for quick action in the test suit, which started as a "friendly" action in the Franklin County Circuit Court, were blocked when the Louisville Automobile Club intervened in opposition to the act. Motel and gas station operators subsequently joined in opposition. Constitutionality of the act was upheld by the Circuit Court in an opinion appealed to the State Court of Appeals.

• **MAINE:** Construction work is under way on the $55,000,000 extension of the Maine Turnpike from Portland to Augusta, with a 1955 completion target date. Plans are to open the Portland-to-Lewiston link sometime next year.

• **MASSACHUSETTS:** Bonds to finance construction of the projected $200,000,000 cross-state Massachusetts toll highway are expected to be offered early in 1954. Meanwhile, a bill has been filed for consideration by the 1954 state legislature under which state gasoline taxes collected on the projected east-west turnpike would be turned over to the State Turnpike Authority for maintenance and operation of the road.

• **MICHIGAN:** After receiving a preliminary report from the engineering firm of Edwards, Kelcey & Beck indicating the feasibility of a proposed 176-mile toll road running west from Detroit toward Chicago, the Michigan Turnpike Authority named an underwriting group headed by Blyth & Co. and First of Michigan Corporation to prepare a revenue bond issue of some $215,000,000 for the project.

Linking with the Willow Run expressway near Ypsilanti, the proposed Michigan toll highway would run north of Jackson, Albion and Marshall, south of Battle Creek and Kalamazoo, west to Benton Harbor and south to New Buffalo, south of which it would connect with the projected Indiana turnpike.

Meanwhile, feasibility surveys of a proposed $100,000,000 turnpike running 102 miles from Detroit to Bay City are being made for the Michigan authority by the engineering firms of Coverdale & Colpitts, New York, and J. E. Greiner Co., Baltimore.

• **NEW JERSEY:** Recent marketing of $135,000,000 New Jersey Highway Authority state-guaranteed bonds

$172 Million Spent on New York Thruway During 1953 Year

End-of-the-year statistics on the 427-mile New York State Thruway line, under construction from New York City to Buffalo:

• 78.1 miles of main line completed at $51,921,677 cost—including 37 miles opened during year.

• 346.4 miles in various construction stages, at contract prices totaling $400,509,697.

• Value of completed work rose during year from $47,864,083 as of Dec. 1, 1952, to $220,742,649 as of Dec. 1, 1953—$172,876,566 expended during year interval.

• Progress on bridges: 145 completed, 304 under construction, including major Hudson river crossing, and 9 remaining to be let.

completed financing for the $285,000,000 Garden State Parkway, construction of which is scheduled for completion in 1954. A $150,000,000 bond issue had been floated in July.

The New Jersey Turnpike Authority, a separate agency, took immediate preliminary steps to pave the way for construction of a Newark Bay-Hudson County extension of the New Jersey Turnpike after selling a $150,000,000 bond issue to finance that project and other purposes. The new extension will run from the Newark Airport interchange to the Holland Tunnel plaza in Jersey City.

• **NEW YORK:** Although it is still too early to estimate the final cost of the new toll superhighway being constructed from New York City to Buffalo, the State Thruway Authority announced in November it had already spent or obligated on the project approximately $506,000,000 or $6,000,000 more than the original authorization.

At the same time it was disclosed that about 17 miles of the road remained to be placed under contract. Also to require additional money are gasoline stations, restaurants and rights of way. Completion of the 427-mile route is scheduled by 1955.

The thruway authority also is committed by law to construct four feeder routes totaling 108 miles as well as a five-mile link from the thruway interchange at Nyack to the northern terminus of the New Jersey Turnpike. While no official estimates of the cost of the extensions have been announced, it previously was unofficially estimated that such connections with the main route would cost at least $150,000,000 and possibly more.

Under authority of a new law enacted in 1953, the Jones Beach State Parkway is expected to market a $40,000,000 bond issue before April to finance acquisition of land and improvement of the Southern State Parkway in Nassau County, extension of the Meadowbrook State Parkway, widening of the Wantagh and Meadowbrook Causeways, and improvement of parking fields at the Jones Beach State Park. The bonds will be secured by revenues from a 10-cent toll to be imposed on the Southern State Parkway.

OHIO: State Turnpike Commission hopes to open 22 miles of the eastern end of the Northern Ohio Turnpike by Nov. 30, 1954, nearly a year before the rest of the 241-mile project is completed. The 22-mile stretch will connect Ohio 18 with the Pennsylvania Turnpike.

Meanwhile, State Highway Department funds are being sought to finance a survey of a proposed 300 mile toll road between Cincinnati and Conneaut. The proposed second Ohio toll superhighway, which has been recommended by the State Turnpike Commission and is favored by Governor Lausche, would run diagonally from the southwest to the northeast corner of the state.

TEXAS: Following its approval of a tentative route for a toll highway between Dallas and Fort Worth, the Texas Turnpike Authority named a committee to negotiate a contract with Coverdale & Colpitts, New York engineering firm, to make an economic feasibility survey. The committee also was empowered to retain other consultants to estimate the cost of construction and maitnenance.

The Texas authority also announced it would seek a court determination of the validity of the state's new toll road enabling act and the revenue bonds which would be issued under it. Exacted by the 1953 Texas legislature, the law gives priority to the proposed Dallas-Fort Worth project expected to cost $30,000,000.

Meanwhile, a "friendly" test suit was filed in the 101st District Court at Dallas by the Texas Turnpike Co. to determine whether property acquired by a private turnpike corporation in Texas is exempt from taxes. The suit asked that property acquired in Dallas County for a north-south toll road be declared public property not subject to taxation. This proposed turnpike would originate north of Gainesville and extend to near the city limits of Corpus Christi.

• **WEST VIRGINIA:** An official estimate of how much more money it will take to complete the West Virginia turnpike was delayed, but figures made public indicated that original cost predictions already have been exceeded by more than $20,000,000.

A quarterly report to trustees by the West Virginia Turnpike Commission revealed that construction contract commitments as of Sept. 30 totaled $59,085,182—a figure that didn't include the $19,509,760.50 for pavement contracts awarded in October. Nor did it include about $1,430,000 that will be required for guard rails and interchange buildings. Other minor contracts remaining to be awarded included one for bridge lighting.

Construction contract commitments thus have passed the $80,000,000 mark that ranges about $20,000,000 higher than the $60,000,000 set out as construction costs two years ago in the prospectus prepared as a basis for marketing the initial $96,000,000 revenue bond issue.

Before setting the amount of a second bond issue, the commission was awaiting word from its consulting engineers, who asked for more time in which to estimate the total project costs. No indication has been given as to the amount of the prospective second bond issue, which is expected to be sold sometime next spring.

(Information on toll projects in other states will appear in the February issue of Roads and Streets).

Mattson succeeds Johnson at Safety Foundation

Joe O. Mattson, of Long Beach, Calif., has been named President of the Automotive Safety Foundation. He succeeds Pyke Johnson, who has retired to a consulting capacity.

Mattson joined the field staff of the Automotive Safety Foundation in 1942, then being loaned to the Highway Traffic Advisory Comimttee to the War Department. Mattson has remained on the Pacific Coast since the war, first in the Foundation's Laws Division, and in recent years as assistant to President Johnson.

Mr. Johnson, a native of Denver, Colo., succeeded Paul G. Hoffman as head of the Safety Foundation in March, 1942. A former Denver newspaperman, Johnson moved to Washington in 1918 to represent the Automotive Manufacturers Association, of which he was made executive vice president in 1939.

Widely known in trade association circles, Johnson has been a member of several U. S. delegations to International Road Congresses in Europe, Central and South America. The French government awarded him the Legion of Honor in 1933.

★ Joe O. Mattson

★ Pyke Johnson

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Only minimum replacement material needed and is poured to straight, smooth edges.

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Sawed lines confine breakout fracturing and speeds removal up to 50%.

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NEARLY 20 YEARS EXPERIENCE
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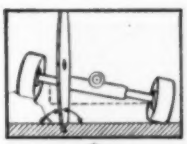
. . . guaranteed to . . . "Provide the fastest cut . . . at the lowest cost." Clipper alone can supply every necessary metal bond . . . in over 36 specifications.



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JOB and EQUIPMENT IDEAS

★ Loader - fed batch plant on Eau Claire project

Each wagon noses next on uphill back-up

An example of a trick that is always a time saver is pictured here. One Euclid 22-ton end-dump driver is helping another driver back his rig up a steep, wet grade to get into loading position. Even with the big, new tires, your wagon hasn't any too much traction when backing uphill empty.

This operation was being very skillfully performed on the West Virginia Turnpike job of Ralph E. Mills Co. and Morrison-Knudsen Co., Inc.

The backing driver was given enough momentum so that he could pull away from the pusher as he hit the working platform, swing his truck at a sharp angle, and come to rest under the swinging dipper. The job was in the early stage when this photo was taken and the path up to shovel so cramped that temporarily there was no level place for a wagon to stand for instant pull-in when the previous wagon moved away. This quick push reduced spotting time and helped keep up a remarkably fast cycle for the 3½-yd. shovel.

★ One Euc pushing another to assist in quick back-up on steep grade

Loader did all the batch plant feed work

Substituting a high-lift loader for a conveyor and seven operators saved Peterson Construction Co. $2.00 per yard on 6,000 cubic yards of concrete during recent construction of a $2,000,000 building in Eau Claire, Wisconsin. Unavailability of ready-mixed concrete in the area made it necessary for the company to purchase a twin-bin weigh batch machine to handle peak pouring loads of 148 yards daily. Then, instead of charging the machine by the standard method of a conveyor and hand shovelers, the contractor purchased a loader (Baker-Lull) to load sand and gravel into the weigh batcher. The loader was also used for loading concrete into 12-ft. high canopy forms, cleaning up on job site, ground leveling, backfilling and materials handling.

• **Making clean pavement cut.** Neatest way to cut out a section of concrete is to saw a dummy groove at the break-out line, then widen this groove to about 2 in. with pavement breaker with chipping tool. This widened groove protects the outer edge during breaking up of the concrete.

Soil-permeability tester

Edmund Thelen, Journal of the Franklin Institute, Vol. 253, No. 4, pp. 340-341, April, 1952. Highway Research Abstracts, February, 1953.

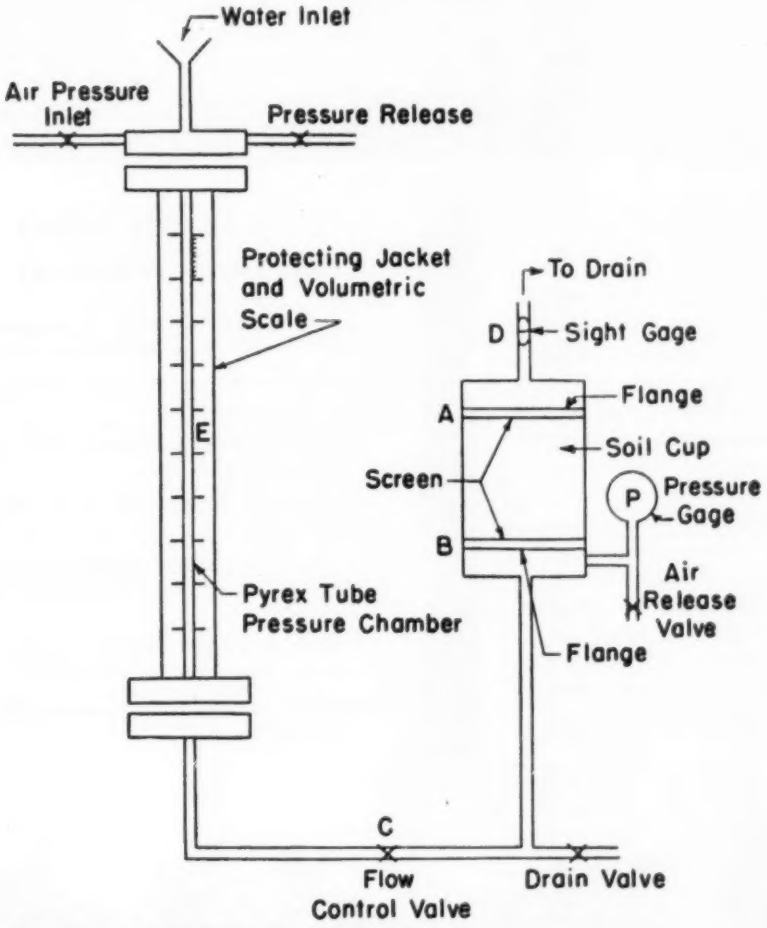
The blending and treating of soils to increase their bearing strengths, reduce their permeabilities to water, and improve their resistance to erosion or caking is a fast-growing field for technological endeavor. Some important successful applications are:

the stabilizing and strengthening of the subgrades under pavements; strengthening the soil under foundations and structures; increasing the service-life of adobe bricks; shutting off the seepage of water around dams, swimming pools, tunnels, and basements; hardening the soil and speeding the drainage of barnyards.

The soil-permeability tester was designed and built by the Colloids Section of the Franklin Institute. The tester provides measurements of the rate of flow of water at various pressures, through treated and untreated soils. It is also used to measure roughly the void content or porosity of soils. Most soils contain 30 to 60 per cent by volume of air, and the underlying idea of many treatment processes is to reduce this porosity as much as possible.

In using the tester to measure porosity, the soil is packed into the cup, between Screens A and B. Valve C is opened, water flows upward slowly through the soil to level D, and the volume of water required to fill the apparatus is read on Scale E. The test is repeated with the soil cup empty; from the difference in volumes the volume of solids in the cup and the soil porosity are easily calculated.

★ How bricks were embedded in the gutter pavement to serve as baffles and control water velocity



★ Figure 1. Schematic diagram of soil-permeability tester

To measure water permeability at various pressures, the soil is packed in the soil cup, and water is permitted to flow through it to Level D. Now the pressure in Chamber F is increased to the desired figure, using a regulated-pressure air supply, and the rate of flow of water through the soil is calculated from the rate at which the water level drops in the chamber. Water permeability often changes as the flow of water through the soil continues, and this change with total flow provides useful informaton regarding the permanence of the soil treatment and the structure of the treated soil.

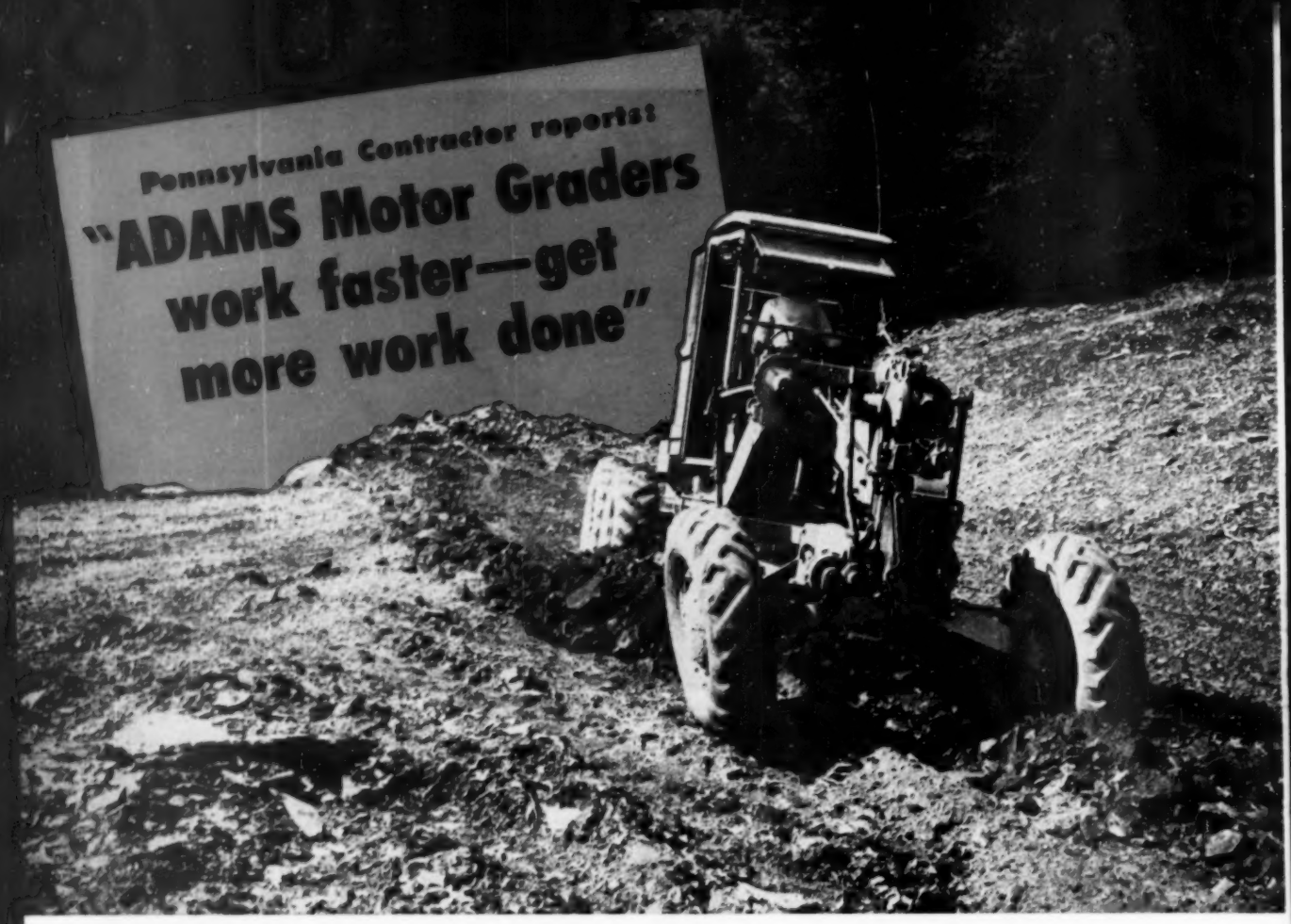
Brick-studded gutter retards flow of water

The intercepting gutter pictured here taps the highest bench of a large hillside cut. It is part of a project which included the relocation of U. S. 35 in southern Ohio to modern standards.

While the paved gutter itself is interesting, being part of a scheme to protect the hillside from erosion and from slides due to saturation, the most obvious feature is the use of several hundred up-ended bricks to retard the flow. The bricks were embedded a fraction of an inch in the fresh concrete. Without this device, the water would gather such high momentum in several hundred feet that a deeper and more costly gutter section or a pipe section would have been necessary to confine the torrent.

Pennsylvania Contractor reports:

"ADAMS Motor Graders work faster—get more work done"



This Adams "550" Motor Grader (100 hp.), owned by A. E. Oblock Construction Co., is relocating 7 miles of road in the rugged mountains of Pennsylvania.

Mr. Oblock will tell you that he likes his Adams "550" for many reasons—its power, fuel economy and high-speed operating advantages in both forward and reverse gears. These high-speed advantages stem directly from the new Adams Constant-Mesh Transmission, the latest and finest ever put into a motor grader. It is, in fact, the only transmission providing 8 forward speeds, up to 26 mph., and 4 reverse speeds, up to 13 mph.

You will find that Adams Motor Graders have more time- and money-saving advantages than any others on the market —bar none . . . advantages that pay off in more work per day, with less effort and greater economy. (See listing at right.)

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- **RUBBER-MOUNTED ENGINE**—floating power—no vibration transmitted to grader.
- **DUAL BRAKING SYSTEM**—quicker, easier, safer stops, with less effort.
- **FOOT ACCELERATOR**—for easier, safer overland travel.

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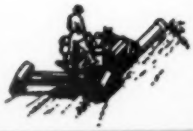
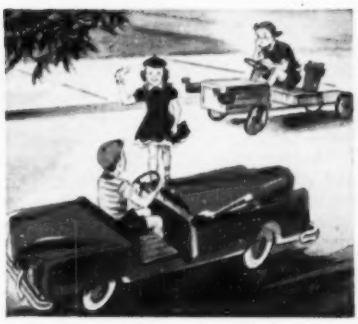


Motor Graders TraveLoaders Pull-Type Graders

You can't compete if your equipment is obsolete!

With construction activity becoming more competitive, even in the face of high labor costs, it is more important than ever before to take a closer look at your operating costs . . . your dirt moving methods . . . your tools and equipment.



Obsolete methods and equipment take a heavy toll by slowing down output, increasing manhours and increasing repairs and maintenance. Efficient material handling equipment can make the difference between profit and loss on most any job . . . help insure that time and production schedules are met without resorting to expensive overtime and wasteful emergency practices.

If you are not using "PAYLOADER" Tractor-Shovels at present, it will pay you to investigate these fast, flexible, rubber-tired loaders that have proven so profitable for so many material producers and contractors, both large and small.

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DIGEST of Current Technical Literature

By JOHN C. BLACK, Associate Editor

Contracting engineers rate next to highest income

Though civil engineers as a group have lower annual incomes than their brothers in chemical, mining, mechanical, or electrical engineering ($8910 median for the chemists—$7390 for the civils) according to a recent survey, the median income for engineers working as contractors (including many of the civil engineering group) is $9920. This compares with $9690 for private engineering practitioners, $8420 for industrial employees, and $7590 for educators. Topping the lot by only a shade over the contractors are the professional engineers holding administrative positions, $9930 median.

These figures are based on reports from more than 12,000 members of the National Society of Professional Engineers, covering the year 1952. They are summarized and analyzed with various interesting breakdowns, including regional distribution, in a 28-page booklet obtainable for one dollar from the *National Society of Professional Engineers, 1121 Fifteenth St. N. W., Washington 5, D. C.*

Effects of calcium chloride in concrete

A very thorough study of the particular effects of both pellet and flake forms of calcium chloride in concrete is summarized as follows by the authors:

"This paper covers the effect of both the pellet and flake forms of calcium chloride as admixtures on the following properties of portland-cement concrete (with and without an air-entraining admixture): (1) compressive strength at 1, 3, 7, 28, and 90 days; (2) modulus of rupture at the ages listed; (3) modulus of elasticity (sonic) at the ages listed; (4) entrained-air content of fresh concrete; and (5) slump of fresh concrete as a measure of consistency. In addition, a short investigation was made on the relative effects of water and moist curing.

"Increases in compressive strength resulted from the use of calcium chloride, in either flake or pellet form, as an admixture. When used in ordinary concrete, the flake form was more beneficial at ages 28 and 90 days than the pellet form. When used in air-entrained concrete, the pellet form was more beneficial.

"Although the moduli of rupture of ordinary concretes at ages of one to seven days were increased due to the use of calcium chloride as an admixture, the moduli of rupture of concretes 28 and 90 days old were, in general, reduced by the addition of flake chloride. Negligible changes or lesser reductions were caused by the addition of pellet chloride.

"Significant decreases in modulus of rupture of air-entrained concretes 28 and 90 days old resulted from the use of some amounts of flake chloride; no significant changes in modulus resulted when the pellet form was used.

"The moduli of elasticity (sonic) of ordinary concretes at ages of one to seven days were increased by the addition of either flake or pellet calcium chloride to the mix. The effect in general of both flake and pellet chloride at 28 and 90 days was not significant.

"Air content of ordinary concrete and air-entrained concrete was generally increased by the addition of either flake or pellet chloride to the mix.

"The slump of ordinary concrete was increased by the addition of certain amounts of flake chloride and decreased by the addition of certain amounts of pellet chloride. Other amounts of both forms of chloride had negligible effects. The slump of air-entrained concrete was increased by addition of chloride, except 4-per cent pellet chloride; this amount caused a decrease in slump as compared to concrete containing no chloride."

Introduction to a paper by J. T. McCall and R. J. Claus, Michigan State College, presented at the thirty-second annual meeting of the Highway Research Board, and published as BULLETIN 75.

Go slow with tight covers on poorly supported gravel

The old spring break-up problem may be aggravated by a "tight roof," according to the Wisconsin observation quoted below.

"Some of the light, untreated gravel surfaces which were standing up fairly well under light traffic became a real problem during spring breakup after the bituminous mat covering was placed. As gravel roads in spring breakup time, they aerated and stabilized reasonably well. Sealed with a bituminous mat, the melt and ground water trapped under the surface caused the foundation to puddle and soften, with resulting complete failure of serviceability of the road surface. Maintenance of bituminous surfaces on weak, inadequate foundations involves relatively high annual cost in our particular geographic area."

From a paper by E. L. Roettiger, Wisconsin State Highway Engineer, presented before the 45th annual meeting of the Upper Peninsula Road Builders' Association, June 9, 1953.

Artistic design in bridge rails and piers

"For appearance' sake avoid unnecessary weight in horizontal members," is the major theme of esthetic consideration in a discussion covering both esthetic and functional phases of bridge design for the New York Thruway. The necessity for speed and economy could not be overlooked, but "we refused to believe that a bridge which would be truly a functional expression of this great artery could not be produced." Admitting that engineers sometimes lack artistic sense, the author comments, "Fortunately this lack does not pervade the entire profession, and indeed we consider it unfortunate that architecture, developed outside our profession, has in many instances descended to mere decoration when applied to bridges. For example, massiveness in railings is purely decorative and not functional."

"Placing a heavy rail or coping on a bridge either by the use of stone or by the use of solid or heavy members destroys the very effect that is sought, and which is ever pleasing to the eye of the observer. To cover the clean vertical lines of piers or abutments, or any other portion of a substructure, by veneer or decoration in such manner that the functional appearance is buried, seems to create a drooping effect. This results in a structure that appears to be struggling to hold itself up, in place of one that enjoys the exhilaration of live loads."

Regarding substructures, whether the crossing be over or under the thruway, the following is noted:

"We opened up the center pier. We developed stub abutments at the top of the side slopes which permitted us to establish a pleasing type of open pier or column bent adjacent to the edge of the outside lanes. With a proper clearance, this design gives a complete, open movement to traffic.

"The design not only creates an even diffusion of light under structures that are extremely wide, where the Thruway is carried over another

"We're rock specialists—

and so are our MICHIGANS"

says Dominick Cutrupi, Jr.

Project: Sewage Disposal Plant, West New York, New Jersey
- Trench 12′ to 20′ deep, practically all through solid rock
- Install 2000 ft. of 84′ diameter concrete pipe, 8-ton sections.

Contractor: D. Cutrupi & Sons
Fort Lee, New Jersey

Equipment: 3 MICHIGAN ½ yard shovel cranes
Two TLDT-20, one TMDT-16

"10 hours a day, six days a week muckin' out rock, doing work of ¾ yard machines—our MICHIGANS take big-league punishment.

"Just as tough as the trench job, almost the whole length through solid rock, is the handling of pipe. A pipe section is lifted off a flat-bed truck by the crane, one end is butted against the front of the machine, and the crane is 'walked' about 300 feet to point of installation—a really delicate operation.

"That MICHIGAN combination of delicate 'handle-ability' and fast, positive air-control action is what we like most.

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facility, but in addition it dampens the roar of a car in the enclosed area under the bridge. Instead of echoing the sound waves, the columns break them up so that the reaction is not unpleasant to the ear of the driver."

From a paper "Bridge design is guided by esthetics as well as functional considerations," by E. W. Wendell in CIVIL ENGINEERING, *November, 1953.*

Shearing strength of column footings

Study and re-evaluation of column footing tests conducted by F. E. Richart between 1944 and 1948 (the most extensive series of such tests to date) indicate that conventional design methods result in safety factors considerably lower for footings than for columns 1.5 to 2.1 for footings against 3.5 to 4.5 for axially loaded tied columns, depending on concrete quality and reinforcement. The relation and effects of superimposed shearing and flexural stresses are considered carefully, with the broad conclusion that the safety factor for shear values in footings "should be closer to the high values used for columns than to the relatively low values connected with a flexural failure of footings."

Calculation of shearing stress at distance *d* (effective slab depth), from the column perimeter, yields less consistent results than at distance zero from the column. In view of present limited knowledge the calculation is necessarily empirical rather than rational: and the observed fact that most column footings fail by "a pyramidal plug of concrete punching through the slab beneath the column" must be reconsidered.

"In design it seems desirable to obtain footings which will develop their full flexural capacity before a shear failure by punching takes place." On this basis, the author's formula for ultimate strength of a square footing supporting a square column is—

$$V_s = \frac{V}{4r\frac{7}{8}d} = \left(0.035 + \frac{0.07}{\phi_o}\right) f'_c + 130$$

in which

V = footing reaction outside a distance d around the column.

d = effective depth of slab.

r = column width.

f'_c = concrete strength (cylinder).

ϕ_o = the ratio of ultimate shearing capacity of the slab to its ultimate flexural capacity.

V_s = shearing stress computed at zero distance around the loaded area.

When $\phi_o = 1$, that is, when shearing capacity and flexural capacity are equal, $V_s = 0.105\ f'_c + 130$.

From a paper, "Shearing Strength of Reinforced Concrete Column Footing," by Eivind Hognestad in the JOURNAL OF THE AMERICAN CONCRETE INSTITUTE, *November, 1953.*

Timber truss erection methods

A detailed step-by-step account of the construction of two 150-ft. Howe truss spans to carry heavy logging trucks over the Salmon River on Vancouver Island, British Columbia, discloses the following over-all procedure.

Falsework for the lower chords was built with bents on 19-ft. enters in order to miss panel points of the bridge. Timbers, rods, and castings for lower chords and floor system were placed on the falsework from a skyline extending between specially erected spar trees. The timbers (seven abreat for each chord) were assembled on the camber blocking, spaced and aligned precisely, and bolted up with pipe keyes. Transverse bracing (struts, blocks, and diagonals) was set in place and bolted up by crews working simultaneously from each end toward the center. Tightening was continued until the lower chords were solid against the struts, all rods were under tension, and no sideways deflection of chords was discernable. Floor beams were then set in place but not fastened. Web members and parts (braces, tension rods, and castings) were then delivered by the skyline to their approximate final positions.

Falsework to support the upper chords was then erected, the bents (cap and end posts) being framed on shore and delivered by skyline. The posts were toe-nailed on top of the floor beams, and an additional post was installed at the center of each bent to withstand the heavy load of timbers to be placed on it. Upper chords for the bridge were assembled and connected in the same way as the lower chords, and then lifted from the falsework by wedges to provide sufficient clearance for the placing of main and counter braces. After the wedges were driven, the transverse bracing was installed in the same manner as for the lower system.

In constructing the web, the vertical tension rods (three per panel point) were lowered beneath the span, and pulled up through the lower chord, angle blocks, upper chord, and gibs by block and tackle. Dowels were inserted in the ends of main and counter braces while the rods were being set in final position. Dowels projected ½ in. beyond the bottom of the brace and about 1½ in. beyond the top end, as precaution against a possible fall of any brace when the tension rods are slacked. When all bracing was in place and fastened, the wedges were knocked from under the upper chords thus taking most of the weight off the end top falsework bent and permitting its removal. When each set of main and counter braces was placed in a panel, the top falsework was removed, the crew finishing the two panels at one end of the span and then moving to the other end to repeat the operation.

With all top falsework out, the crew began tightening tension rods, working as before from ends to center of the span. This operation continued until counter braces became snug against angle blocks, rods were all under tension, and the entire bridge had been "picked up" off the falsework. As is usually the case, the complete tightening operation had to be repeated two or three times before full camber was reached. Now that the bridge had assumed its final shape, the lower chords were drifted to the corbels, and the portal braces bolted in position. Stringers and laminated deck completed the job except for the asphalt surface.

The eight-man crew of the Provincial Department of Public Works erected one of the spans in twelve days and the other in eight (considered remarkable time).

Costs for the job, including abutments and center pier, were:

Fabricating and creosoting bridge spans	$ 16,344
Labor	26,320
Equipment rental	7,266
Material and miscellaneous	56,347
Total	$106,277

From a paper by Roy H. Macdonald, Engineer, B. C. Dept of Public Works, submitted as a competitive thesis to the Canadian Construction Association and published by permission in ROADS AND ENGINEERING *(Toronto) for September, 1953.*

Asphalt underseal to stop slab pumping

At least four states—Ohio, Missouri, Illinois, and Michigan—have used asphalt undersealing successfully to check pumping of pavement slabs. On a Michigan job on US-24 south of Flat Rock, 1½-in. holes are drilled through the pavement and asphalt at 400 deg. F. is pumped in.

Original pattern of holes was one every 25 ft. in each of the four traffic lanes, with holes staggered to give a penetration point every 12½ ft., but this was changed to a 12½-ft. spacing in the outer lanes to insure complete sealing in the more critical areas. About 20 to 25 gals. of asphalt is pumped into each hole under 30 lbs. pressure. Inspections on excavated test areas show a very satisfactory distribution of the seal material, with complete filling of voids. When sealing is complete the slabs will receive a top surface of heavy duty asphalt.

Drilling costs are 20 cts. per hole. Contract price for asphalt pumped is 25 cts. per gal. Working rate, about 12,000 gal. pumped per day.

From MICHIGAN ROADS AND CONSTRUCTION, *302 Hollister Bldg., Lansing 3, Mich., August 13, 1953.*

Construction safety aid—a sign with indicator lights

A major factor in reducing accidents on the Eildon dam construction in Australia (an £11,000,000 project now nearing completion by Utah Construction, Ltd., subsidiary of the American firm, Utah Construction Co.) is a conspicuous sign designed by the company's safety engineer to make employees safety-conscious, to keep them aware of the danger of accidents and, incidently, of the threat to their pay envelopes.

"Near the point where the men assemble every shift to be picked up, the safety engineer has erected a 10 by 10 foot brightly colored sign. On the left side there are three lights, a red which signifies a lost time accident, an orange which records a near miss and a green—safe. Throughout the 24 hours one light is burning. This appears to bring home safety consciousness to everyone on the project. The sign also tells how many days since the last accident, and compares the present month with the last month's accidents. In brightly colored paint at the bottom is the slogan: 'Keep the green light shining, work safely'."

From an article by Roth Jones in WORLD CONSTRUCTION, *July-August, 1953.*

Plan for a district safety council

Considering pain and death and economic loss, the author of this paper believes that state highway departments, like other large-scale employers, have both unrealized opportunities and unfulfilled obligations in preventing accidents. Going beyond the typical advance efforts of safety planning, warnings, and the establishment of special safety departments, he suggests that a permanent committee or council be set up in each district, to give continuous consideration to the subject broadly and to the particular problems, conditions, and events of their own jurisdiction.

"One of the most important duties of such a committee could be the supervision of safety or job planning meetings. . . . There are a number of types of safety or job planning meetings that can be most effective when organized and planned carefully. Some of these are:

"*Lecture Type:* Someone makes a talk on a particular phase of an operation. (The council can have a member do this, or better still, assist one of group.)

"*Demonstration Type:* One or more of group actually go through different steps of a work plan, explaining same.

"*Safety Inspection:* Tools and equipment are checked for hazards, as well as for needed repairs.

"*Job Analysis for Safety Study:* Work plan, step by step, is studied to determine and eliminate hazards."

Considering a particular piece of work, the plan operates in this way:

"The group lists on the blackboard or a sheet of paper, the different steps of the jobs that are likely to produce accidents. Then they discuss each of them briefly, pointing out the hazards and devising ways of eliminating them, listing the results of their discussion opposite the discussion points. In other words, they work out a plan to do the work immediately in hand in the most efficient manner without accidents. Now, (and this is where the district council can be effective) a copy of this job analysis is filed with the council, where a study is made of same.

"Additional discussion points are added, together with any comments or corrections in regard to the right hand side of the sheet where the means of preventing accidents are shown. Thus the thinking of the men who do the work—the immediate supervisor, and the management of the district—have been combined and are working hand in hand, not only to prevent accidents but to get the job done in the most efficient manner."

Any accident must be followed immediately by rigorous analysis and action to prevent recurrence if possible. Personnel to make a most effective council is discussed, along with various other details.

From a paper by R. E. Lindsey, Director, Insurance Division, Texas Highway Department, in TEXAS HIGHWAYS, *November, 1953.*

Why air in concrete increases its durability

"The entrained air in concrete, in the form of minute disconnected bubbles, provides spaces where forces which would cause disintegration, can be dissipated. Because of these spaces, the use of heretofore troublesome aggregates and cement has been made possible. Also, the minute disconnected air bubbles, by sharply reducing bleeding and segregation in the fresh concrete, tend to prevent capillary and water channel structure in the hardened concrete."

"Entrained air acts as an added flexible aggregate and improves greatly the workability of concrete. The improved workability results even with the use of more angular and more poorly graded aggregates. The minute, disconnected air bubbles, capable of complete flexibility in shape, are a new, cheap and very important source of lubrication. Because of the entrained air, a truly plastic concrete is obtained. Through the lubrication values of the entrained air, a lower slump, just as placeable, concrete is made possible."

Air-entrained concrete has proven to be about three times as impermeable to water as plain concrete.

The author discusses clearly the advantages and the relatively minor disadvantages of air-entrainment, notes the proper mixes for various purposes, and recommends various techniques.

From an article by James A. Nicholson in ROCK PRODUCTS *for June, 1953.*

Non-continuous grading of concrete aggregate

An investigation has been made on the effects of omitting material between 3/8 in. and 3/16 in. from the continuous-type gradings for ¾-in. gravel aggregate. Two cement contents (about 520 lb. and 610 lb. per cu. yd.) were used, corresponding roughly to 1:2:4 and 1:1½:3 concretes. The material below the gap was sand; that above it was coarse aggregate. The aggregate was rounded limestone gravel with a small proportion of crushed gravel. A gap of this nature can be obtained by using a single size (¾-in. to ⅜-in.) coarse aggregate. A near gap, that is when only a small amount of material of the gap size is present, may occur between ⅜-in. and 3/16-in. when fine and coarse aggregates are obtained separately.

The tests show that for the ¾-in. aggregate used, certain gap-gradings omitting ⅜-in. to 3/16-in. material may produce a concrete with better workability, density, and water requirement than a continuous grading. They show that care must be taken in choosing the proportion of sand, as a wrong choice may result in concrete liable to segregation due to an excess of coarse aggregate or concrete which has a low density and high water requirement due to an excess of sand.

From HIGHWAY RESEARCH ABSTRACTS, *July 7, 1953.* [*J. D. O'Keeffe, Concrete and Constructional Engineering (London), Vol. 48, No. 5, pp. 173-178, May 1953*].

New Publications

"STATE TRAFFIC SAFETY—ITS ORGANIZATION, ADMINISTRATION AND PROGRAMMING," by Maxwell Halsey, executive secretary Michigan State Safety Commission, published by the Eno Foundation for Highway Traffic Safety, Saugatuck, Connecticut.

STRUCTURAL EFFECTS OF HEAVY-DUTY TRAILER ON CONCRETE PAVEMENT. Special report 14, a supplemental investigation to road test One—MD. The Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

★ At foremen's safety meeting, Construction Assn. of W. Pa.: Raymond H. Hahn, personnel and safety director, Allegheny Asphalt & Paving Company; Harry Brainerd, manager of the Western Pennsylvania Safety Council; Ross Hill, administrative assistant, Pennsylvania Department of Labor & Industry; Howard Sturdy (speaking), President of the Association; Carl J. Jacobsen, chairman of accident prevention committee; Levi B. Duff, director, department of public works, Allegheny County; Samuel Abernathey, director of safety, Allegheny County; Earl Stephan, safety consultant, Western Pennsylvania Safety Council.

Contractor men hold annual safety meeting

The Fall Superintendents' and Foremen's Dinner Meeting on Accident Prevention was held by the Constructors Association of Western Pennsylvania in the English Room of the Fort Pitt Hotel, Pittsburgh, Pa., Friday, November 13. The attendance was the largest Fall meeting in the Association's history.

Superintendents and Foremen along with other company representatives were shown a preview of the new construction safety film, "The Gambler," by the Caterpillar Tractor Company. The movie depicts the many hazards in equipment operation and likens them to the game of Russian Roulette.

Raymond H. Hahn, Personnel and Safety Director of the Allegheny Asphalt & Paving Company, presented a brief talk on Safety Enforcement in Construction. He stressed the importance of proper planning and supervision of all construction activities and emphasized that the duty of the contractor extended beyond the safety of his men to the public itself.

Truckers asked to cooperate during storms

Truckers on the Pennsylvania state highways have been asked to double-check their chains and sanders, and also to pull onto the shoulder during severe snow or ice storms until the roads can be plowed or cindered. Early in the winter maintenance superintendents in each county personally canvassed the principal motor trucking companies to get their cooperation.

★ H. C. "Pat" Maginn (center), executive vice-president of Calaveras Cement Company, new president of the northern California chapter of AGC. Shown with vice-president E. L. Clements (left) of Hayward, and treasurer Gordon Pollock (right) of Sacramento. This AEC chapter is the oldest of the National Association's 124 constituent groups, and largest unit in the heavy construction field with nearly 500 active and associate members.

Asphalt plant in colored talkie

Barber-Greene's new 16 mm. film of their Series 840 plant covers not only the set-up as a whole, but the component units separately and in various working combinations, including both hot and cold mix. To make the story complete, the outfit is shown being towed in transit—each unit on its own rubber tired mount—and in process of erection. Scenes are included from world-scattered points. Animated drawings illustrate many details of operation. The highest types of mix, as well as lower types are shown in production. The whole film is in color. Length 26 minutes.

The story is told in dialogue between the editor of a regional construction magazine and the contractor who operates the plant. The title, "A Profit for Everyone," sets the theme —low cost roads anywhere, through use of suitable equipment. A Spanish version, "De Provecho para Todos," is also available. Reels in either language can be obtained on loan without charge by writing to Wayne D. Adamson, Jr., Advertising Manager, Barber-Greene Co., Aurora, Ill.

New Jersey employees get service awards

Representing 30 centuries of combined service and road building experience, 2,300 employees of the New Jersey highway department recently received service awards commemorating employment ranging from 5 to 30 years. As ordained by the legislature, the 30-year veterans numbering 170 received gold pins with a pearl inset. There were 250 25-year employees, 315 20-year, 925 10-year, and 633 5-year employees.

• Over 230 contractors with estimated work capacity of $200 million were registered with the Kansas Highway Commission and qualified as of November 1, 1953. Seventy-two were from out of state.

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● More miles of highway were built on entirely new location in 1953, marking a trend destined to grow. Harding Blasting Company's job under Funderbunk Construction Co., prime contractor, U.S. 99 Oregon

Estimated Expenditures for Highway and Street Purposes

Preliminary Report, U. S. Bureau of Public Roads

Expended on	1952 Preliminary Estimate		1953 Forecast	
State Highways:	Million dollars	Percent	Million dollars	Percent
Capital outlay	2,070	41.3	2,371	43.5
Maintenance	616	12.3	652	11.9
Administration[3]	130	2.6	135	2.5
Highway police	98	2.0	103	1.9
Interest	72	1.4	100	1.8
Total	2,986	59.6	3,361	61.6
Local Rural Roads:				
Capital outlay	396	7.9	401	7.4
Maintenance	604	12.0	613	11.2
Administration[3]	57	1.1	60	1.1
Interest	28	0.6	30	0.6
Total	1,085	21.6	1,104	20.3
Urban Streets:				
Capital outlay	402	8.0	421	7.7
Maintenance	391	7.8	407	7.5
Administration[3]	61	1.2	64	1.2
Interest	44	0.9	46	0.8
Total	898	17.9	938	17.2
Federal expenditures not classified by system:[4]	45	0.9	50	0.9
All roads and streets:				
Capital outlay	2,913	58.1	3,243	59.5
Maintenance	1,611	32.1	1,672	30.6
Administration	248	4.9	259	4.8
State highway police	98	2.0	103	1.9
Interest	144	2.9	176	3.2
Grand total	5,014	100.0	5,453	100.0

(1) Federal and State data are for calendar year; local data are for varying fiscal years.

(2) Includes expenditures by States on transcity connections of State highways.

(3) Includes engineering and equipment costs not charged to capital outlay and maintenance, and other miscellaneous expenditures.

(4) Includes funds of other agencies expended directly by Public Roads as well as funds expended by those agencies. Expenditures were principally for capital outlay and are included as such in the totals.

Year-end look

(Continued from page 34)

modern cities. Cleveland's problem was studied by the Automotive Safety Foundation and a far-reaching program of action recommended. Detroit and Philadelphia are among the cities now tackling the urban transportation problem from a broad city management point of view.

CITY STREETS

The nation's street gridirons continued to groan under traffic overloads, with gradual progress made toward applying such proven relief measures as one-way routing, off-center laning during rush hours, elimination of rough track zones, and better traffic signing and marking. The problem of curbside car storage and enforcement of "no parking" on arterials and in central business districts —which would afford major relief in many places—is still entangled in politics in many cities. Rapid growth of parking metering, however, was a notable trend, and bituminous resurfacing of many miles of old street surfaces saw major progress in many communities.

BRIDGES

The rapid advance in pre-stressed concrete bridge construction was a feature of the year. Many contractors got into the picture for the first time, while research and development activities were pushed by all interested agencies.

During the year the longest all-welded highway viaduct ever built was opened as part of the San Francisco Bayshore Freeway System.

Among the large bridges awarded were the Richmond-San Rafael bridge in California ($35 million), Gautier-Pascagoula bridge, Mississippi ($6 million), Paseo Bridge, Kansas City ($12 million), Gloucester Bridge, Delaware River ($13.2 million). The $50 million Thruway crossing over the Hudson was pushed. The $98 million crossing over the Straits of Mackinac into Upper Michigan was financed during December and the contractors given the go-ahead.

Bridge structures, chiefly grade separations, have mushroomed as an element in the highway program, as more limited access facilities are undertaken. The New York Thruway for example, will need 550 bridges, the Ohio Turnpike 325, other projects in proportion. The design trend is toward achitectural streamlining and use of open-type over-passes with shallow abutments, cutting understructure cost and permitting future lengthening for dualization of the roadway beneath.

The chief road bridge problem in most localities continued to be the one

of financing replacement of tens of thousands of old, narrow, small bridges. A set of suggested standard design details of small bridge decks, issued late in the year by the BPR, made an important contribution.

ROAD MAINTENANCE

A total of $1,672 billion was estimated to have been spent for maintenance of all roads and streets during 1953, a 4 per cent increase over 1952. The year produced few radical changes in techniques, but rather a continued trend toward more complete mechanization, under the spur of inadequate funds, rising traffic, ageing roadbeds and high labor costs.

An AASHO committee under V. L. Ostrander of New York state is studying new or unfamiliar equipment as being worthy of possible application. Many of these have special value for roadside work.

New techniques in concrete pavement joint maintenance, involving both hot and cold poured rubber asphalt compounds, received attention; Minnesota completed several large major contracts covering joint rehabilitation.

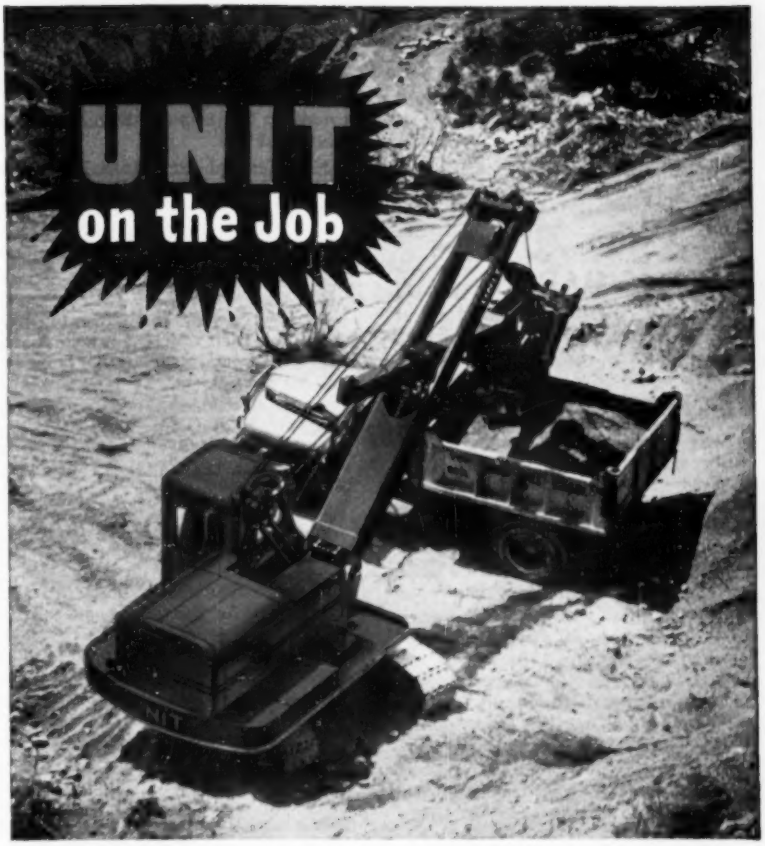
Contract maintenance gained in volume, as contractors turned more actively to this field for jobs, with the contractor associations actively promoting contract road repairs as a state highway department policy. Some states during the year individually spent a million dollars or more on contract-performed maintenance or repairs, Ohio and Kentucky being examples of leaders in this respect.

FEDERAL LEGISLATION

The year marked a growing awareness of the economic importance of roads among Washington leaders. The most notable highway event was the series of hearings held by the McGregor subcommittee on roads of the House. The purpose was to review the highway problem as a basis for re-examining national policies. The voluminous testimony presented by a succession of engineers, officials and industry representatives represents the most complete data on roads ever to be made available to Congress.

These hearings will be of great advantage during the coming months, when Congress will consider federal highway aid legislation for the next fiscal biennium. There is considerable sentiment in Congress for increasing the federal appropriation for roads from the present $575 million to $900 million. The American Association of State Highway Officials recommends this level, including $250 million annually for the 40,000-mile interstate system.

The question of whether the federal government should withdraw from the field of gasoline taxation will be tied into the picture. Key members of



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the House and Senate public works committees were expected to meet in January with a 5-man AASHO committee to hear AASHO's recommendations, and the report of a 25-man commission on Federal-State relations is scheduled to be presented in March.

The prediction is that the gasoline tax set-up, state and federal, is likely to remain essentially unchanged.

STATE LEGISLATION

While the legislatures in 44 states took an extremely active interest in highway affairs, their actions resulted in major increases in road financing or important advancement of policy in only a few states. Ohio voters approved a $500 million bond program, to be concentrated on a 6,200-mile network selected from the 16,000-mile state highway system by a citizens advisory committee. In New York a temporary commission on highway financing began consideration of a proposed $2.8 billion 10-year road program.

The coming year will be an "off" one in the state legislature. It is expected, however, to see a record amount of interim study and advance planning, aimed at the introduction of road legislation in 1955.

A legal affairs committee was recently established by the Highway Research Board, in recognition of the welter of obsolete, inadequate, conflicting or confused laws affecting all phases of highway work. Considered a model for the task is the legislative overhaul adopted as a "package" by the North Dakota legislature during 1953, following a study by the Automotive Safety Foundation.

HIGHWAY TRANSPORT

A turning point was reached in both public and engineering attention to the broader economic aspects of highway development. The financial success of the toll roads in particular helped spotlight the economics of the traffic stream, and the role of modern highways in the rapid, efficient flow of people and goods.

Several states led by Oregon have begun to use the potential benefits of the traffic stream as a yardstick in determining where, and when, to improve a road and how much expenditure is justified.

Highway research organizations are devoting increasing attention to the broader concepts. A pioneer step in the study of highway transport was taken jointly by Texas A & M College and the Texas Highway Department, launched with retired Commissioner MacDonald and retired chancellor Gibb Gilchrist as consultants. New academic participation in highway affairs was evidenced in other states.

Chief immediate question in this field is the one of the truck and its relation to the roadbed. The final report on the Maryland road test was published by the Highway Research Board, the Idaho test road entered the traffic phase, and discussion continued on the proposed $8 million midwest road test.

New federal and state legislation is needed to permit fuller participation in large-scale joint-venture research projects, such as test roads, in which several government agencies and the interested industries can participate.

Meanwhile the controversy continues between the trucking industry and the highway departments, as to the damage caused by heavy trucks and the design and economic problems involved. Ohio, New York and several other states joined the ranks of the states taxing trucks on a ton-mile basis.

TRAFFIC VOLUME

Rural vehicle travel broke all records in 1953 for the eighth consecutive year, gaining an estimated 5 per cent, with higher gains in individual states (New York up 11.2 per cent). The arterial volume continues to gain slightly faster than the general total travel outside of cities. The rural traffic flow mileage for 1953, estimated at 246 billion vehicle-miles, represents about one-half of the total 537 billion annual vehicle-miles of motor vehicle movement in the U. S., the rest being urban on a comparably rising pattern. Truck and truck-trailer rural mileage increased slightly, continuing a steady upward trend.

Today an estimated 54,745,000 motor vehicles are on the road, up 2.7 per cent, 9,670,000 being trucks, truck-trailer combinations, and buses. Trucks comprise from 20 to 35 per cent of the flow on many heaviest traveled arterials, and the average gross load as well as axle load is still increasing. The spectacular growth of trucking, which has tripled in a decade, is a factor in the growing pressure for increased road programs.

TRAFFIC ACCIDENTS

The traffic safety problem continued to be acute and essentially unsolved in most areas. Traffic fatalities were expected by the National Safety Council to reach 38,900 for the year, compared with 38,500 and 37,300 for 1952 and 1951, respectively. This is close to the all-time record, set just prior to the war before a concerted accident-prevention program had been worked out.

The large 1953 total is attributable to the growth in vehicle registration and traffic volume, and a consequent greater number of accident exposures. However, the fatality rate for the first 9 months, estimated at 6.7 per hundred-million vehicle-miles, marks a continued down trend from the 1952 rate of 7.0.

The White House Conference on Highway Safety, scheduled for February 17-19 in Washington, will "pick up the ball" from the Action Programs of previous conferences and stress the need for every community to develop the necessary leadership to apply accident-prevention techniques in the fields of engineering, enforcement, education, laws, motor vehicle administration, traffic signing and marking, and public relations.

While modern highway design will contribute more and more toward accident reduction, as new roads are completed, there is a growing recognition of the basic danger inherent in speed. Speed and other control has become imperative particularly on toll roads and heavily traveled arterials. The turnpike authorities are presently pioneering new control techniques, including wider use of radar-equipped patrol vehicles and new types of signing and signaling.

OFF-STREET PARKING

This problem continued to gain greater attention from city officials and businessmen. Pittsburgh took the lead among large cities by selling $37 million in parking revenue bonds, to finance what is termed the most completely integrated parking program yet developed for the downtown area of any city. Significantly this program resulted from an engineering study and analysis. Chicago also has a program of bond-financed multi-story parking garages, city owned but to be leased to private operators. The city's $8,000,000, 2,400-car underground lakefront garage is nearing completion.

These and other urban parking developments are part of a broader appreciation of the need to solve traffic terminal facilities on a long-range basis. Costly radial and inner belt expressways, now under construction in a number of cities, will be only partially effective in relieving congestion until interchanges and dispersion ramps leading to ample parking facilities and street systems can be built.

The parking problem was the subject of a series of engineernig reports, issued by the Highway Research Board in cooperation with several engineering colleges. At least four universities are currently investigating the impact of parking deficiencies on retail business. The acuteness of the problem is reflected in the speed with which members of the National Retail Drygoods Association snapped up 8,000 copies of a study covering 27 methods of parking finance.

NEED STUDIES

State-wide engineering studies of highway need, following concepts and techniques evolved largely since the

war, were carried out in more states than in previous year. Minnesota, Louisiana, Kentucky, West Virginia, and Tennessee are making or embarking on such an appraisal under Automotive Safety Foundation guidance. Idaho and Indiana are considering such studies. Florida has one in connection with the proposed toll road into Miami. Virginia is expanding from the limited single-route study made two years ago, and Rhode Island is studying needs for an enlarged road program. Washington is using the need study method as basis for developing a long-range project scheduling program.

A study in parking economics

"Parking As A Factor In Business —Part 1, Attitude Toward Parking and Related Conditions In Columbus"; by C. T. Jonassen, Department of Sociology, Ohio State University. This 50-page report gives a thorough analysis of the economics of the parking problem in a business district. For a copy address the Highway Research Board, 2101 Constitution Avenue, Washington, D. C.

FOOTNOTES TO TOLL ROAD SUMMARY

(1) Facilities marked with an asterisk (*) are principally resort or seasonal roads, not serving through traffic. In addition, the Connecticut and Westchester County (N. Y.) parkways were not built as self-liquidating, limited-access toll roads, a 10-cent toll is levied on passenger vehicles passing through toll gates, and commercial vehicles are denied use of the parkways. Omitted from this tabulation is the 122-mile Florida Overseas Highway (in operation) and the 41-mile Jacksonville, Florida, Expressway System (under construction) which are not classed as toll roads. Tolls are collected only on bridges.

(2) Where total costs are not available, bond sales or estimated costs are shown. Interest during construction and other initial financing costs are included.

(3) A 10-cent toll was first collected on the Fleetwood Viaduct (cross-county parkway) in 1914. In 1947, the toll station was discontinued on the Viaduct and stations were set up on the southerly ends of the Saw Mill River and Hutchinson River parkways. The three parkways are considered as an integrated toll road system.

(4) Initial bond issue. Additional funds will be required to complete the road.

(5) Legislation has been enacted authorizing construction of these toll roads or enabling projects to be constructed if found feasible. Financing arrangements have not been completed.

(6) 1953 Legislature authorized a 10-cent toll on the existing Southern State parkway to help finance a $40 million parkway construction and improvement program.

(7) Includes toll roads authorized, or recommended for study as to feasibility by State Governors, highway department or turnpike officials, or legislative committees. As of current date, plans and location have not been firmly established; cost and mileage data are therefore only approximated. Omitted are (a) projects discussed informally, (b) those proposed but not currently under consideration, (c) projects studied and found unfeasible, and (d) those for which enabling legislation has failed of enactment.

Status of Toll Road and Bridge Projects

Compiled as of October 1, 1953, by the U. S. Bureau of Public Roads

State	Facility (1)	Built or Estimated Completion Date	Mileage	Cost (2) (000)
	Completed and in Operation			
Colorado	Denver-Boulder Turnpike	1952	17.3	$ 6,366
Connecticut	Merritt Parkway	1940	37.5	20,592
	Wilbur Cross Parkway	1949	29.5	17,500
Florida	Buccaneer Trail*	1950	15.0	4,600
Georgia	Brunswick-St. Simon Causeway*	1924	11.1	650
Maine	Turnpike (Portsmouth to Portland)	1947	47.2	20,600
New Hamp.	Turnpike (Seabrook to Portsmouth)	1950	14.7	6,770
New Jersey	Turnpike (Del. River to Geo. Wash. Br. Interchange)	1952	117.6	280,000
New York	Westchester County Parkways:			
	Saw Mill River Parkway	(3)1926	25.1	8,000
	Hutchinson River Parkway	(3)1927	14.5	6,000
	Cross-County Parkway	(3)1940	4.0	1,800
	Long Island Parkways:			
	Meadowbrook and Loop Causeways*	1934	8.3	5,000
	Wantagh Causeway*	1934	5.1	2,000
Oklahoma	Turner Turnpike (Oklahoma City to Tulsa)	1953	88.0	38,793
Pennsylvania	Turnpike (Irwin to Carlisle)	1940	158.9	77,164
	Eastern Extension (Carlisle to Valley Forge)	1950	100 9	87,000
	Western Extension (Irwin to Ohio Line)	1951	67 4	77,500
	TOTAL		762.1	$660,335
	Under Construction			
Maine	Portland-Augusta Extension	1955	60.0	$55,000
New Hamp.	Portsmouth-Rochester Extension	1955	20.0	14,000
	Central Turnpike	1955	40.0	22,500
New Jersey	Garden State Parkway (Paterson to Cape May)	1954	165.0	285,000
New York	Thruway (N. Y. City to Buffalo)	1954	427.0	500,000
	Captree Parkway*		4.2	7,300
Ohio	Turnpike (Pa. Line to Ind. Line)	1955	241.4	326,000
Pennsylvania	Del. River Extension (Valley Forge to U.S. 13)	1955	32.3	65,000
West Virginia	Turnpike (Charleston to Princeton)	1954	87.6	(4)96,000
	TOTAL		1,077.5	$1,370,800
	Authorized But Not Financed(5)			
Connecticut	Fairfield County Thruway (N. Y. Line to R. I. Line)		125.0	$213,000
Florida	Sunshine State Parkway (Stuart to Miami)		110.0	50,000
Indiana	Turnpike (Ohio Line to Ill. Line)		150.0	225,000
Maine	Augusta-Ft. Kent Extension		....	.....
Massachusetts	Turnpike (N. Y. Line to Rte. 128)		123.0	200,000
Michigan	Detroit to Bay City		100.0	125,000
	Detroit to Toledo		....	.....
	Detroit to Indiana Line, near Gary		....	.....
New Jersey	Turnpike Extensions:			
	Geo. Wash. Br. interchange to N. Y. Line		20.0	75,000
	Newark Airport interchange to Holland Tunnel		8.5	118,000
	Newark-Columbia Turnpike		59.0	300,000
	Bordentown interchange to Pa. Turnpike Extension		6.0	25,000
New York	Thruway Extensions:			
	Niagara Thruway			
	Erie Thruway			
	Berkshire Thruway		113.0	150,000
	New England Thruway			
	Nyack-New Jersey Turnpike Link			
	Southern-State Parkway(6)		....	.....
North Carolina	Gastonia-Mt. Airy Turnpike		125.0	200,000
	Nags Head-Va. Line*		32.5	3,000
Oklahoma	Turnpike Extensions:			
	Tulsa to Missouri Line		....	.....
	Oklahoma City to Kansas Line		....	.....
	Oklahoma City to Texas Line		....	.....
Pennsylvania	Turnpike Extensions:			
	Gettysburg Extension (to Md. Line)		40.0	40,000
	Erie Extension (Pittsburgh area to Erie)		115.0	100,000
	N. Y. Line to Ohio Line via Erie		57.0	55,000
	Northeastern Extension (Phila. to Sayre)		125.0	100,000
	Del. River crossing link to N. J. Turnpike		....	15,000
Texas	Dallas-Ft. Worth Turnpike		33.0	31,000
	Dallas-Ft. Worth area to San Antonio		276.0	150,000
Virginia	Va. Beach-N. C. Line*		22.7	660
Washington	Tacoma-Everett Turnpike		70.0	70,000
Wisconsin	Chicago-Twin Cities Turnpike		287.0	200,000
	TOTAL		1,997.7	$2,445,660
	Proposed(7)			
Kansas	Kansas City to Okla. Line via Topeka and Wichita		210.0	$120,000
Kentucky	Louisville to Elizabethtown		40.0	30,000
Louisiana	Lafayette to Lutcher		80.0	90,000
Ohio	Cincinnati to Conneaut		300.0	400,000
Virginia	Richmond to Petersburg		36.0	57,000
	TOTAL		666.0	$697,000

THE LIFT OF THE TIDE and Expert "Know-How"

This dredge weighing 181 tons was drawn from a creek at Repaupo, N. J., moved 5½ miles and launched in the Delaware River. Additional equipment, a total of 250 tons, was also moved in 20 loads.

A special ramp was built at the river, the dredge "winched" into position and the lift of the 6 foot tide used to float the dredge.

Two weeks were required for this entire operation. But the actual moving was done in one day on two Rogers 50-ton low bed trailers and two Rogers 75-ton dollies.

"KNOW HOW" based on long experience was displayed by E. A. Gallagher of Philadelphia in this unusual move. Apparently, too, they KNOW that Rogers equipment can't be beat for these difficult operations.

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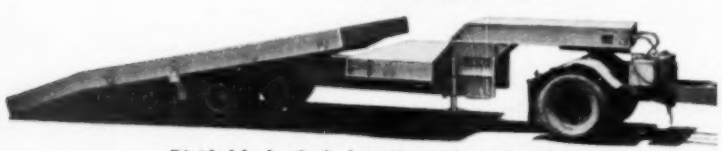


Divided bed, tilt deck trailer with gooseneck.

Meetings Ahead

ASSOCIATED EQUIPMENT DISTRIBUTORS—Annual Meeting, Waldorf-Astoria Hotel, New York City; January 31-February 2.

ASSOCIATION OF ASPHALT PAVING TECHNOLOGISTS—Annual Meeting; Kentucky Hotel, Louisville, Ky.; February 1-3.

CALIFORNIA STREET AND HIGHWAY CONFERENCE—Sixth annual conference, sponsored by Univ. of California Institute of Transportation and Traffic Engineering—University at Los Angeles; February 3-5.

AMERICAN SOCIETY OF CIVIL ENGINEERS—Spring Meeting, Hotel Biltmore, Atlanta, Georgia, February 15-19.

NATIONAL READY MIXED CONCRETE ASSOCIATION; Annual Convention—Conrad Hilton Hotel, Chicago, Ill.; February 15-19.

NATIONAL SAND AND GRAVEL ASSOCIATION; Annual Convention—Conrad Hilton Hotel, Chicago, Ill.; February 15-19.

WHITE HOUSE CONFERENCE ON TRAFFIC SAFETY—Departmental Auditorium, Washington, D. C.; February 17-19.

NATIONAL CRUSHED STONE ASSOCIATION; Annual Convention—Conrad Hilton Hotel, Chicago, Ill.; February 22-24.

AMERICAN CONCRETE INSTITUTE—Annual Meeting, Denver, Colorado; February 22-25.

ANNUAL HIGHWAY ENGINEERING CONFERENCE—University of Colorado, Boulder, Colo.; February 25-26.

ASSOCIATED GENERAL CONTRACTORS OF AMERICA, INC.—Annual Meeting, Statler and Biltmore Hotels, Los Angeles, Calif.; February 26-March 3.

ILLINOIS HIGHWAY ENGINEERING CONFERENCE; 40th Annual Meeting—University of Illinois College of Engineering, Urbana, Illinois; March 2-4.

MISSISSIPPI VALLEY HIGHWAY CONFERENCE—Edgewater Beach Hotel, Chicago, Ill.; March 4-6.

ASSOCIATION OF HIGHWAY OFFICIALS OF NORTH ATLANTIC STATES—30th Annual Meeting, Shoreham Hotel, Washington, D. C.; March 10-12.

PURDUE ROAD SCHOOL—Annual school, Purdue University, Lafayette, Indiana; April 19-22.

• Stephen W. McClave, Jr., an engineer who participated in the design of the George Washington Bridge and Lincoln Tunnel approaches and other metropolitan works in the New York area, died recently in Englewood, New Jersey, age 72.

How Shift Change Traffic is Expedited at Atomic Plant

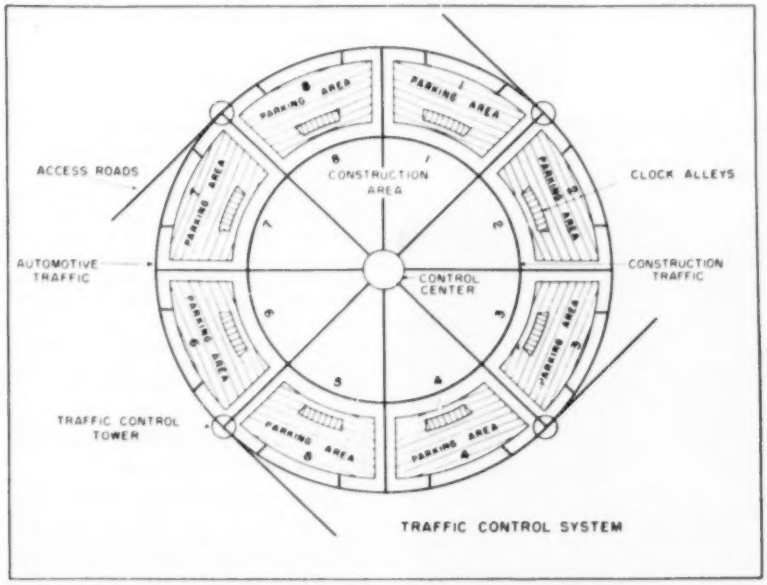
IN CONSTRUCTION today the words "craftsman" and "automobile" are synonymous. Automobiles, their control and parking on a big project, present big problems which require careful study, planning and expenditure of funds. The nature of construction often does not allow time for advanced planning and construction of roads and parking lots. Such was the case at Paducah, where a $500 million atomic energy plant has been under construction since early 1950. Planning and construction had to be carried out while the main project progressed.

All previous estimates to the contrary, on this project actual records indicate that the average passenger per private automobile conveying workmen is 2.3; and as recently occurred on this project, with a peak employment in the order of 23,000 employees, the problem of parking, control, and safety of approximately 10,000 private vehicles, particularly at the end of working shifts when each individual workman departs with the evidenced intention of beating the rush, can and did become a major problem. The proper solution to the traffic problem was therefore imperative.

Early in the project temporary roads were planned and constructed by F. H. McGraw & Company, prime contractor, primarily for construction traffic and secondarily for vehicular traffic in such fashion as to provide ultimate capacity for peak loads of both types of traffic.

Parking lot location and capacity in relation to access roads and clock alleys was the subject of careful engineering studies. As the result, the most feasible diagramatic solution appeared to be in the form of two concentric circles surrounding the actual construction area: the circumference of the outer circle representing vehicular traffic with accesses to the principal highways represented as tangents; the circumference of the inner circle represented construction traffic with the clocking alleys located in the immediate vicinity of this circumference, and the capacity of the parking areas represented by that area between the outer and inner concentric circles. This diagramatic solution was then applied to actual conditions, and temporary roads, parking lots, and access roads were constructed accordingly. An important consideration which made the construction of these roads and lots a complex task was the necessity for the effective control of traffic during the construction period.

★ Traffic control tower at Paducah project. Guard uses loudspeaker to instruct drivers on main entrance highway. Tower is equipped with a two-way radio for contacts with other towers, patrol cars, and control center



★ Basic traffic control idea used at Paducah: a roadway system designed around two concentric circles. Construction vehicle traffic is routed to the inner circle, while automotive traffic is kept on the outer circle

Traffic Control System

Concurrently with the above study, the methods for actual physical control of vehicular traffic in motion was considered. The control of such a volume of traffic by guards on foot was not considered feasible, because it allowed no coordination of the traffic pattern and, particularly during the twilight period, introduced a grave physical danger to the guards concerned and resulted in inevitable

accordion movements of vehicles with attendant danger of collision. It was therefore decided that a system of traffic control towers equipped with radios, acoustical loud speakers, and supplied with manually operated traffic lights of simple design and moderate cost would provide for a centralized coordination of traffic control. This traffic control, under the direction of the traffic director, would thus allow the director to receive positive reports from all portions of the area, and from these reports he could then make decisions pertaining to the actual vehicular flow.

A total of five such portable towers were designed and constructed and placed at strategic control points. The utilization of these towers plus regular radio-equipped patrol cars has resulted in the complete control of traffic from a centrally located control point.

By manual synchronization of lights, the accordion movements of vehicular flow have been completely eliminated. No control personnel are in exposed positions, and the manpower involved in traffic control is kept to a minimum. Safety messages to workmen, current conditions of roads and visibility, and any information regarding traffic congestion occurring on off-the-area routes, which information is received from state highway patrols, are transmitted by loud speakers mounted on the traffic towers. As in most engineering problems, performance is the final criterion of success. In this particular problem, it appears that performance has been eminently successful in that a daily flow of 8,000 vehicles has been moved at major shift change time from their parking area completely off the construction area in an average time of 17.3 minutes.

Concrete Institute to mark golden anniversary

The American Concrete Institute will celebrate its Golden Anniversary at its 50th annual convention in Denver, Colo., February 22-25, 1954. Commemorating 50 years of service to the concrete engineering field, the ACI convention will feature sessions devoted to the latest developments in structural design, precast and prestressed concrete, and research on materials and properties of concrete.

A special session will feature addresses by noted industry leaders—W. A. Dexheimer, Commissioner of Reclamation, Bureau of Reclamation, U. S. Department of the Interior; Rear Admiral Joseph F. Jelley, Director of Construction, Department of Defense (formerly, Chief of Bureau of Yards and Docks, Department of the Navy); Norman P. Mason, Chairman, Construction and Civic Development Department Committee, Chamber of Commerce of the United States; and Major General Samuel D. Sturgis, Jr., Chief of Engineers, U. S. Army—on the use of concrete by the construction industry and government agencies.

A new Standards will be presented for adoption by Institute membership, on recommended practice for selecting proportions for concrete (mix design), submitted by ACI Committee 613. The American Concrete Institute-Portland Cement Association film, "How to Transport, Place, Cure, and Finish Quality Concrete," will also have its premier showing at the convention. This film is a sequel to "Quality Concrete," the ACI-PCA film on proper techniques in making good concrete introduced at ACI's 1953 convention in Boston.

R. F. Blanks, vice-president and general manager, Great Western Aggregates, Inc., Denver, is general chairman of the local committee for the event. Other committee members are E. C. Higginson, head, Concrete Laboratory Section, U. S. Bureau of Reclamation; B. W. Lorance, chief structural engineer, T. H. Buell and Co.; R. F. McCune, general manager, J. L. Peterson, Inc.; R. W. Morris; Orley Phillips, engineer with R. J. Tipton & Associates, Inc.; S. H. Poe, engineer and technical editor, U. S. Bureau of Reclamation; W. H. Price, head, Engineering Materials Laboratory, U. S. Bureau of Reclamation; Damon Runyon, consulting engineer, Longmont, Colo.; A. J. Ryan, Crocker & Ryan; and E. W. Thorson, district engineer, Portland Cement Association.

Turnpike officials meet to talk truck problems

Officials of three Turnpikes—Pennsylvania, New Jersey and Ohio—met at Harrisburg in December to discuss subjects relating to the safe operation of motor cargo vehicles on their superhighways.

It marked the first step toward establishing standards of uniformity which would insure the greatest amount of safety on the toll roads of today and the future.

T. J. Evans, chairman of the Pennsylvania Turnpike Commission, outlined to them the purpose of the conference. David E. Watson, Pennsylvania commission member, who presided, noted that throughout the nation there is a lack of uniformity as to laws, codes and regulations with respect to what are considered to be highly desirable and necessary uniform standards.

During the past few years, the Pennsylvania Commission has conducted surveys with the hope of arriving at conformity with the Pennsylania Motor Vehicle Code, and the rules and regulations of the Pennsylvania Public Utility Commission and the Interstate Commerce Commission.

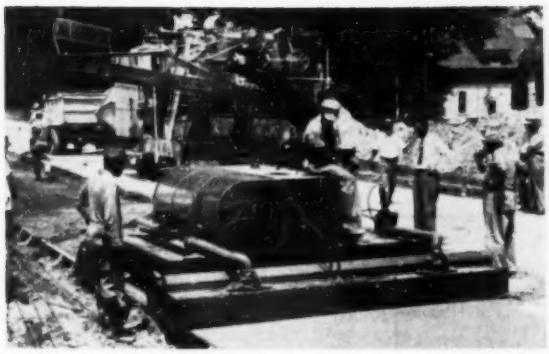
Watson explained that the Pennsylvania Turnpike Commission has not yet seen fit to enact, adopt or promulgate such a code because it felt that the New Jersey Turnpike Authority and the Ohio Turnpike Commission should be fully advised of the intention and given the opportunity to participate in discussions of the subjects under consideration.

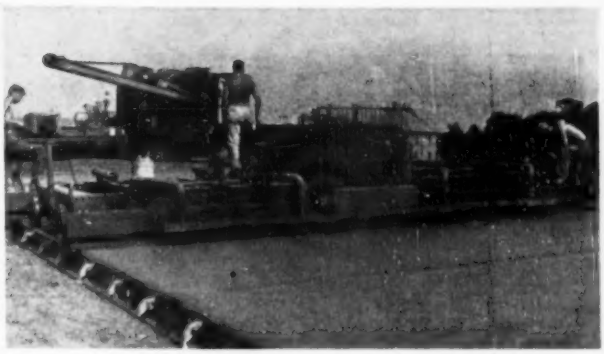
Bartelsmeyer named chief engineer in Illinois

Ralph R. Bartelsmeyer, president of the Illinois Engineering Council, and superintendent of highways of St. Clair County, Ill., has been made chief highway engineer of Illinois. He succeeds Frank M. Barker who resigned recently to take a position with the Santa Fe Railroad.

Pint sized crusher for lucky child

★ This hand-built chrome plated ⅛ in. scale model of a Universal primary crushing plant will be a feature of the Pettibone-Universal display at the coming Sand and Gravel Convention and the National Crushed Stone Convention, to be held at the Conrad Hilton Hotel, Chicago, in February. Valued at $30,000 the model is an exact replica of the big machine





★ (Left): New finisher on Michigan state road job being operated as a single-lane unit. No spreader or bullfloat used in conjunction. (Right): The finisher with frame and screeds extended for two-lane paving operation

New Hydraulic Finisher Speeds Concrete Paving Work

Much has been heard recently about a new hydraulically operated concrete finishing machine, reported to cut finishing time sharply and give an improved job compared with mechanical-type finishers. It has been in use on a dozen or more state highway test jobs during 1953.

This Flex-Plane unit, which in some instances has enabled the contractor to dispense with the bullfloat or even the spreader, is also completely portable, adjustable rapidly to any lane width, and simple in operation according to the manufacturers.

The chief departure in design is its hydraulically reciprocated screeds. These take the place of the rotary screed drive in mechanical machines. According to the Flex-Plane's makers the rotary screed drive of former machines is not completely efficient, in that the screeds are raised very slightly at the end of each stroke. In addition, at the end of each stroke the screeds "pause," creating a slight dragging action. These two seemingly small details are responsible for slower, less efficient and more expensive hand finishing operations, explains the manufacturer.

The piston-activated machine eliminates both these details. The piston operates in a horizontal plane, insuring that the screed is in perfect contact with the concrete throughout its cycle. Because of the piston action, there is no slowing of the screed transverse, i.e., no drag.

On test jobs in Michigan, Ohio and elsewhere, the finishing crew has found it easy to keep right behind the machine.

The advantage of the new principle is said to be particularly well shown on super-elevated curves, where the concrete is held at the high form and does not roll toward the lower form line. Hand carry-back of material is thus eliminated, as shown on test jobs.

The finisher's operating speed can be varied from 0 to 100 strokes per minute, affording just the right speed for best finish. The front and rear screeds are independently operated and controlled to conform to job conditions. Thus travel and screed speed can be controlled by a dial worked by the operator. The machine has a travel and back-up speed up to 2½ times that of mechanical finishers, the working speed being up to 24 ft. per minute and reverse up to 220 ft. per minute, contributing to greater daily yardages.

Court decision on specs

A Court of Claims recently ordered the Government to reimburse a contractor for the cost of running a power line where the specifications indicated such power available without expense. The Court ruled that the Government was responsible when it made positive statements in its specifications or on its plans for the guidance of bidders. The bidders have a right to rely on information regardless of contractual provisions which require investigation by the contractor. — *Bulletin from Virginia Road Builders Association.*

• **Ward P. Christie,** for the past ten years with the Bureau of Public Roads, died December 16 at age 64. Mr. Christie was an authority on contract management and construction equipment ownership practices, having developed policies and procedures now recognized as standard throughout the contracting industry.

• **Duncan M. Campbell,** chief engineer, Cook County (Ill.) Highway Department, died November 24. He had made his career entirely with the department except for World War I military service.

★ Flex-Plane finisher at work on Lakeshore Freeway in Cleveland. Great Lakes Construction Co., contractors

WHAT'S NEW
in EQUIPMENT and MATERIALS

Overman Spreader Has Dual Vibrator

Development of a new dual vibrator for the Overman asphalt spreader has been announced by the I. J. Overman Mfg. Co., Marion, Ind. It is designed to feed a cold or hot mix uniformly to the screed plate

Overman Asphalt Spreader

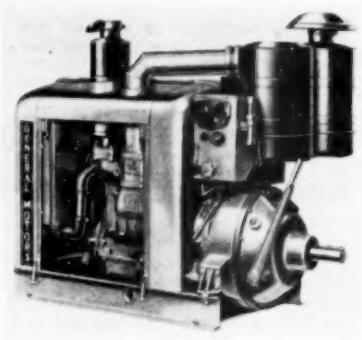
of the Overman spreader and the manufacturer asserts it gives level compacted surface free from waves. The screed plate is held firm for proper alignment by the use of three springs. The complete unit can be moved from job to job at any road speed.

On bound-in post card please fill in description of item on which more information is desired. The card is provided for your convenience in making inquiry and in obtaining catalogs or other data. Card works for both advertising pages and reader items.

Drop post card into outgoing mail. No stamp is required.

76 HP Power Package Weighs Only 1450 Lb.

A new valveless diesel power package developing 76 brake horsepower at 2500 rpm and weighing only 1450 lb. has been added to the line of industrial engines manufactured by the Detroit Diesel Engine Division of General Motors, 13400 West Outer Drive, Detroit 28, Mich. The engine is one of the Division's "4-51" models and has many features of design contributing to simplicity and portability. It is claimed to be especially adaptable for use in rock crushers, small shovels, air compressors, pumps and other construction equipment where adequate power in a compact package is desirable. Like other Detroit Diesels it is an engine of two-cycle design with a Roots-type blower forcing fresh air into and exhaust gases out of the cylinders. It has four cylinders arranged in line and is a "square" engine with 4.1" bore and 4.1" stroke. Compression ratio is 18 to 1. It has automotive type electrical push-button starting. Notable features of design include the elimination of valves and valving mechanisms accomplished through the use of intake and exhaust ports in the cylinder liners, a pneumatic-type governor that has no rotating parts and a lubricating oil pump built around the crankshaft thereby eliminating the need for gear or chain drive on this assembly.



Detroit Diesel's Valveless "4-51" Power Package

Diesel Engine Tune-Up Kit

A tune-up kit, containing all the tools required to perform a speedy and accurate tune-up job, in accordance with factory specifications, on Series 71 General Motors diesel engines has been announced by the Kent-Moore Organizations, Inc., 5-105 General Motors Bldg., Detroit, Mich., manufacturer of special automotive service tools and equipment. The set, which bears the catalog number J-5345, consists of 16 separate tools.

General Model 327—1 Cu. Yd. Dragline, Clamshell, Lifting Crane

1-Yard Dragline; 17-Ton Crane

A new 1 yd. dragline or 17-ton lifting crane is now in production by Osgood-General, P. O. Box 515, Marion, O. Built into the new Model 327, are stated to be many features that are ordinarily not available, or are offered only as optional equipment on some machines—such features as roller-bearing mounted hoist drums; roller-bearing mounted hook swing rollers; anti-friction bearings on superstructure main shafts; independent boom hoist, with power up and power down; enclosed deck gears, machine cut gear teeth; flame hardened gears where extra stress occurs. Swing gear in crawler frame is made separate from crawler frame, and has machine cut teeth. Features which are not standard, but are optional, to produce a machine to conform to the user's requirements, are: independent travel; torque converters and fluid couplings; rapid folding and backhitch high gantry; boom stops for safety; different widths of tread belts, and various combinations of boom point sheaves. Statistics include: 12 ft.-10 in. long crawler; standard width 11 ft. Standard boom is 45 ft. long, all-welded, with heavy tubular lacing, available as flange or pin connected. Boom inserts of variable lengths are available. Two types of fairlead are offered, either the standard swing type, or the optional revolving type. The revolving type is fitted with anti-friction bearings in sheaves and spindle.

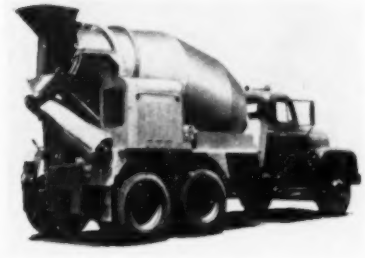
6000 Lb. Cedarapids Bituminous Mixing Plant

A new Cedarapids batch-type bituminous mixing plant has been announced by Iowa Manufacturing Co., Cedar Rapids, Ia. The new Model G-60 is the largest bituminous mixing plant in the Cedarapids line, redesigned from the Model E type plant with 50% greater capacity. Its 65 cu. ft. aggregate batcher and 60 cu. ft. mixing unit permit capacities ranging from 5,000 to 6,500 lb. per batch, depending upon aggregate weight per cubic foot, percentage of asphalt, screening conditions, and plant drier capacity. The plant may be operated manually or semi-automatically with full pneumatic controls, or batching and control equipment may be completely automatic and controlled electronically (optional). Electric time and sequence locking system controls mixing time periods, bitumen batcher gates, aggregate batcher gates, and discharge gate of the mixing unit. Signal lights assure accurate information on each phase of the cycle, and the operator has an unobstructed view of the discharge gate at all times. The closely controlled batching of the Model G-60 gives the versatility which enables the contractor to change the type of specification mix with practically no delay. Several types of mixes may be run the same day without loss of production and no loss of time for operational change-over. The base unit of the G-60 bituminous mixing plant consists of the tower structure, totally enclosed hot elevator, a Cedarapids Model S 48 in. x 14 ft. double-deck horizontal vibrating screen enclosed in sheet metal dust housing, a 29 cu. yd. 4-compartment storage bin with overflow chute from each compartment and reject chute for oversize material, 60-cu. ft. twin-shaft mixer, 65 cu. ft. aggregate batcher, bitumen batcher, bitumen pump unit, and complete pneumatic controls with compressor.

Model G-60 Cedarapids Batch-Type Bituminous Mixing Plant

Truck Mixers Feature Weight Distribution

New 5 and 6 cu. yd. truck mixers featuring improved weight distribution have been announced by Willard Concrete Machinery Sales Co., Lynwood, Calif. The center of gravity has been moved forward and lowered by combining the pedestal and 90-gal. water tank. Thus greater payloads are possible on any 10-wheel truck of 175-in. wheelbase or more, yet they are well within legal highway load limits. Power for the mixing drum is supplied by a rear side mounted Chrysler 6-cylinder industrial engine. Equipped with fluid drive, this engine is claimed to offer exceptional operational control when used with the combination throttle and overcenter drum brake which are standard on the Willard mixer. All controls are conveniently located. Improved engineering design provides built-in strength and lightweight throughout frame and drum construction. Easy concrete placement is accomplished with the rachet controlled chute which measures 14 ft. when extended.



New Truck Mixer

Diesel Engine Driven Welder

Newest addition to the "Multi-Range" welder line of Hobart Brothers Co., Hobart Square, Troy, O., is a diesel engine driven arc welder of 300-ampere capacity, especially designed for locations where electric power is not available and a minimum operating cost is desired. It is powered by a General Motors Model GM-2055, 2 cycle unit injection diesel engine. The engine has a piston displacement of 141.8 cu. in. and is rated at 67-h.p. at 1500-r.p.m. Equipped with patented "Multi-Range Dual Control" and exclusive remote control, this new welder is stated to permit the operator to make fine voltage-ampere adjustments right at the work, eliminating unnecessary steps from the work to the machine and back again. Its 1,000 combinations of voltage and ampere are stated to permit the operator to select the right arc intensity to suit any job.

Hobart Diesel Engine Driven Welder

Trucks for Use in Rough Terrain

Two new four-wheel drive models specially designed for use in rough terrain have been announced by the motor truck division of International Harvester Co., 180 North Michigan Ave., Chicago 1, Ill. The two models are the International R-140-4x4, with gross vehicle weight rating of 11,000 lb. in 130 or 142 in. wheelbase; and the R-160-4x4, with GVW rating is 15,000 lb., in 154 and 172 in. wheelbase. Front and rear axles of both new models are single reduction hypoid bevel gear type. Transfer case in both has 1 to 1 to 1.87 gear ratios providing, in combination with the four-speed transmissions, 8 forward and 2 reverse speeds. The transfer case is designed for the mounting of a full-torque power-take-off at rear of input shaft.

Model R-140-4x4 is powered by the 100 hp. International Silver Diamond 220 engine, with a maximum torque of 173.5 at

Model R-140-4x4 with Failing Drilling Unit

2,000 rpm. Standard transmission is a sliding gear selective type with four speeds forward and one reverse. Power take-off openings are located on the right and left sides to handle front-mounted winch. Optional transmission is the four-speed, syncromesh, with one power take-off opening. Standard tires are 7.50x17, eight-ply for front and single rear; duals in this size are also available. For added traction and flotation, 8.25x17 tires, single or dual rear, and 9.00x18 front and single rear are also available.

Model R-160-4x4 is powered by the 180 hp. International Silver Diamond 240 engine. The SD-240 delivers 108 hp., with maximum torque of 192 at 1,400 rpm. Standard transmission is a sliding gear selective type with four speeds forward and one reverse with power take-off openings on right and left sides. Optional transmission is a four-speed syncromesh type with one power take-off. Standard tires are 7.50x 20, eight-ply front and dual rear; 8.25x20 front and dual rear tires are optional. Both models are available with front-mounted winch.

New 1⅝ Cu. Yd. Tractor Shovel in Earthmoving Operation

New Tractor Shovels in Capacities 15 Cu. Ft. to 2¼ Cu. Yd.

A completely new line of tractor shovels, announced by Clark Equipment Co., Buchanan, Mich., consists of six separate models which will be marketed under the trade name "Michigan Tractor Shovel." Clark Equipment Co. also manufactures Michigan power shovels, cranes and draglines as a result of its acquisition last May of Michigan Power Shovel Co., Benton Harbor, Mich. The tractor shovels will be available for delivery to customers, through franchised construction equipment dealers, in the Spring. The three major types in production are: Two-wheel drive with bucket wheel drive and rear wheel steering; two-wheel drive with rear drive wheels and bucket wheel steering; four-wheel drive with rear wheel steering.

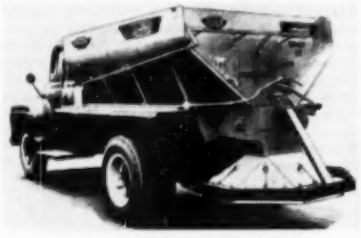
The equipment will be made at the outset in six models ranging in capacity from 15 cu. ft. to 2¼ cu. yd. Individual models and catalog designations are: 12-B—15 cu. ft. capacity, bucket drive, rear wheel steering; 75-B—1 cu. yd. capacity, bucket drive, rear wheel steering; 75-R—1 cu. yd. capacity, rear wheel drive, bucket steering; 75-A—1 cu. yd. capacity, four-wheel drive, rear wheel steering; 125-A—1⅝ cu. yd. capacity, four-wheel drive, rear wheel steering; 175-A—2¼ cu. yd. capacity, four wheel drive, rear wheel steering.

The tractor shovels will utilize a new transmission designed by Clark's Automotive Division at Jackson, Mich., where it is being manufactured. The transmission, which incorporates a torque converter with a three to one torque multiplication factor, is a constant mesh type with full-pressure lubrication. It is operated from two manual control levers on the steering column. Another lever emerging through the floor board controls the overdrive.

Other features of the tractor shovels include: The design is predicated upon easy accessibility to all major components, any one of which may be removed in its entirety without removing other components. Steering boosters are standard equipment on all models, one of a number of features which will contribute to easy operation. The foot-operated conventional clutch has been eliminated. Replacing it are two manual controls mounted on the steering column to control forward and reverse motion, and a manual mechanical overdrive lever, with low and high overdrive, allowing speeds up to 28 miles per hour. A system of planetary reduction of 3.2 to 1 in outer wheel hubs has been designed specifically for this new equipment. It results in a low torque load on axles and provides a particularly high factor of safety in design.

Hydraulic Spreader for Ice Control

The new 1954 model hydraulically-driven Hi-Way Model E sand, cinder, salt and chloride spreader manufactured by Highway Equipment Co., 616 D Ave., N. W., Cedar Rapids, Iowa, for ice control, seal coat and dust control work features independent control of the conveyor drag chain and the spreading disc. In well controlled tests spreading Grade CC rock salt, this hydraulic spreader is reported to have applied: 2 ounces per sq. yd. at 3 mph., 8 mph., 15 mph., over a 40 ft. width; 3 ounces per sq. yd. at 3 mph., 8 mph., 15 mph., over a 40 ft. width; 4 ounces per sq. yd. at 3 mph., 8 mph., 15 mph., over a



Hi-Way Model E Spreader

40 ft. width. One hydraulic motor provides complete control of the width of spread, while a second hydraulic motor gives completely independent control of the density of material. This is stated to mean that at any speed, in any gear, the operator can spread whatever density of material he wants, in whatever width he wants up to an 80 ft. width. Advantages claimed in maintenance include: hydraulic relief valve so that machine will stall out if conveyor chain should jam for any reason; no open sprockets, chains, universal joints, bearings, shafts or clutches, heavy-duty gear-type hydraulic pumps and motors built especially for the purpose.

Paving Breakers, Tampers, Rock Drills

A complete new line of contractors' air tools for 1954, announced by the Davey Compressor Co., Kent, O., consists of newly-designed tools which are reputed to incorporate numerous exclusive and unusual features. Paving breakers are now being offered in 4 sizes from 35 to 90 lbs. The backfill tampers are available in 32 and 45 lb. types. Rock drills include 4 models—28 to 58 lb.

Power Sweeper

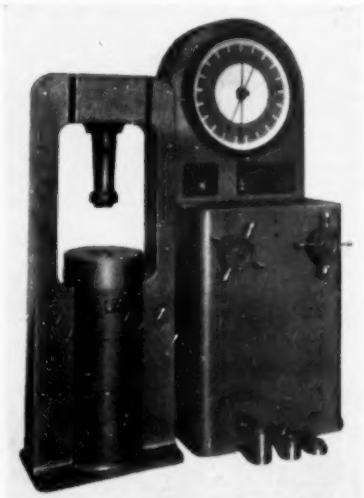
A new power sweeper has been announced by Little Giant Products, Peoria, Ill. Called the Yard Bird, the sweeper can be pushed by fork lift truck, motor truck, industrial tractor, farm tractor, Jeep, etc. Special clamps are available for attaching or detaching in as little as 3 minutes. No tools are required. The broom is powered by a Wisconsin AEN air-cooled engine and sweeps a path 4 ft. wide. It is equipped with a 9 cu. ft. collection hopper and

Yard Bird Pushed by Fork Lift Truck

a 25 gal. sprinkler system to control dust. A 20 in. gutter broom is optional equipment. The sweeper is mounted on three large rubber-tired swivel casters. A heavy bumper surrounds the entire unit.

50,000 Lb. Cement Tester

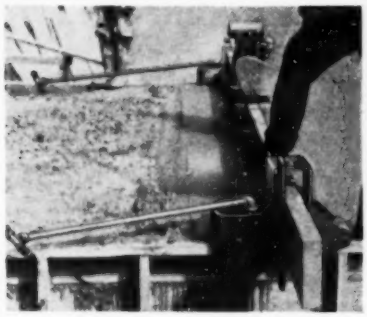
A new 50,000-lb. cement tester for plastic mortar cubes, cylinders and beams, announced by Baldwin-Lima-Hamilton Corporation, Philadelphia 42, Pa., was designed to meet all requirements of ASTM Test Method C 109-52. This is provided primarily by means of the highly accurate, null-balance Tate-Emery indicator which is oeprated by an Emery hydraulic cell in the loading unit and a servo-motor. The indicator dial is 24 in. in diameter with three full-scale ranges of 0-5000, 0-20,000, and 0-50,000 lb. The Emery capsule and loading frame have a load capacity of 100,000 lb. which can be used by connecting a 16-in. Emery precision load dial, available as extra equipment, into the manifold of the Tate-Emery indicator. The loading unit is of welded construction which permitted a reduction of weight.



Baldwin Hydraulic Compression Testing Machine

Vibrating Screed for Concrete Finishing

An improved vibrating screed is now being offered by Stow Manufacturing Co., 65 Shear St., Binghamton, N. Y. Heart of the screed is the efficient motor unit, the "Power Pak." This consists of a 2 hp. Briggs & Stratton gasoline engine and a built-in vibrator. The engine unit is mounted on a multi-plane base, fitted with four vibration dampeners, which completely isolates the engine from the screed's vibration. The engine features a throttle control by which the operator may vary the frequency of vibration from 3,600 to 4,800 vpm. to best accommodate the consistency of the mix being placed. This engine is also equipped with a centrifugal mercury clutch carrying the motor drive pulley. This clutch automatically throws out when the motor is idling, to prevent

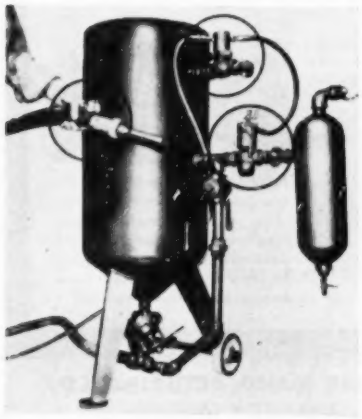


Stow Vibrating Screed Finishing Surface of Concrete Culvert

loading the engine when starting. The wooden screed beam supplied as standard equipment with the screed is available in lengths from 7 ft. to 31 ft. A screed package is furnished contractors using their own wooden beam. This package includes the "Power Pak," together with heavy brackets, pair of rollers complete with shoes, handles, deflectors and all necessary bolts.

Valve for Sandblast Machines

A new Recova remote control deadman valve for all types of sandblast machines, announced by Clementina, Ltd., 2277 Jerrold Ave., San Francisco, Calif., is claimed to provide instant control of blasting at nozzle head, to reduce manpower and material costs by 20-40%, and to insure complete on-the-job safety for workmen. Blasting is started by depressing hand valve (left). To stop blasting, operator merely releases hand valve. Resulting pressure drop opens bleed-off valve (center) in less than two seconds, completely releasing all pressure. Air intake valve (right), through which pot is charged, is simultaneously closed in order that no pressure may enter. If accident should cause operator to drop nozzle, "deadman" feature of hand valve instantly stops machine, protecting against injury or damage from blast.

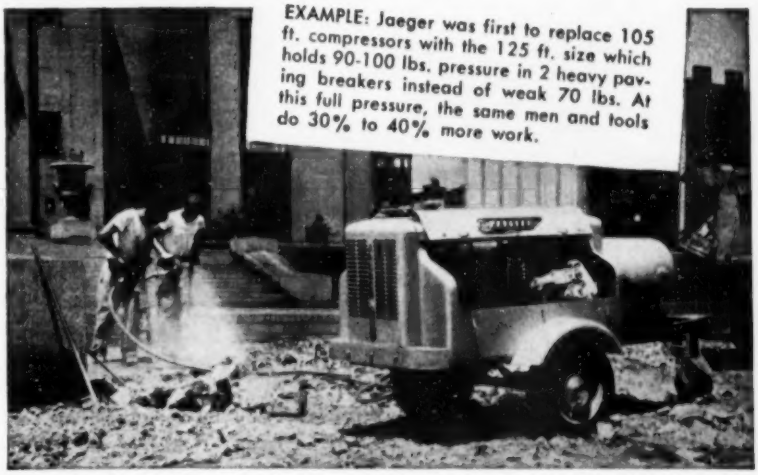


Recova Valve for Sandblast Machines

Boomstop Prevents Crane Boom Accidents

A new boomstop announced by McCaffrey-Ruddock Tagline Corporation, 2131 25th St., Los Angeles 58, Calif., prevents boom kinking and twisting by automatically cutting off power the moment the boom is raised too high. Boom travel is stopped instantly without dangerous shocks and strains. Entire operation is automatic, no adjustments are necessary, nothing has to be turned on or off. Crane is protected from the moment the engine is started until the work is completed. Two Boomstop models are available: MODEL 5000, for small cranes up to 20 ton capacity; and MODEL 10000, for cranes from 20 ton to 100 ton capacity. Dual spring-loaded rams, mounted on the "A" frame or gantry of the crane, provide a soft, cushioning effect, and arrest boom movement when a load cuts loose and boom whips back. Rams prevent boom being raised too high. Two vacuum valves operate the Boomstop clutch and master clutch. Valves are mounted at the base of the boom, and connected through tee connections to the vacuum supply tank. A vacuum pump is used on diesel powered cranes; manifold pressure, on gasoline powered cranes. Vacuum chambers used for the two valve operations pull 750 lb. at 5 in. of vacuum.

Jaeger "air plus" puts full wallop into any set of tools


EXAMPLE: Jaeger was first to replace 105 ft. compressors with the 125 ft. size which holds 90-100 lbs. pressure in 2 heavy paving breakers instead of weak 70 lbs. At this full pressure, the same men and tools do 30% to 40% more work.

75 ft.
125 ft.
185 ft.
250 ft.
365 ft.
600 ft.

Comparable increases in production are obtained with all 6 Jaeger "new standard" ratings. Their performance has been proved-in-use by thousands of units in the field. First cost and operating cost, per cu. ft. of 100 lb. air, is far below any "old standard" size machine.

See your Jaeger distributor or write for Catalog JC-1.

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LOADERS • PUMPS • MIXERS • TRUCK MIXERS • PAVING MACHINES

choose the "right weigh" to profits!

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Manufacturers of HOPPER SCALES and AUTOMATIC BATCHING EQUIPMENT

Hardy Scales Co.

Write for Descriptive Circular

South Atlantic Blvd. & E. 57th, Maywood, Calif.

Side-Dump Trailer for Off-Highway Hauling

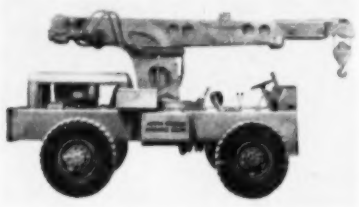
The new Model TD-1832H side dump trailer of Easton Car & Construction Co., Easton, Pa., built to work with Caterpillar DW20 tractor, has successfully passed its

Model TD-1832H Side Dump Trailer

first on-the-job test, hauling 32-ton earth loads on a stripping and fill operation. Big single tires, low center of gravity, and outboard-mounted hydraulic jacks are stated to assure remarkable lateral stability, even while dumping on the run. Dumping is powered by two outboard-mounted hydraulic jacks controlled from the operator's seat. Dumping is to one side only, but interchangeable mounting of the body and jacks permits the direction of dump to be reversed. Easton's patented door mechanism operates automatically as the body is raised for dumping, or lowered. While the maximum dumping angle is 50 degrees the door becomes flush with the floor at 20 degrees, forming a chute to discharge the load clear of the running gear. In the fully dumped position the door can ride up and down over a windrowed load without injury to the operating mechanism. This equipment is offered for sale through all Caterpillar dealers, and marks the first time that Easton Car & Construction Co. has departed completely from a direct sales policy.

New Austin-Western Hydraulic Crane

A new indoor-outdoor tractor mounted hydraulic crane, announced by Austin-Western Co., Aurora, Ill., is said to be a completely new development in the materials handling fields. Combining the best features of crawler, truck and erection cranes with those of industrial shop cranes, the new Austin-Western machine is self-

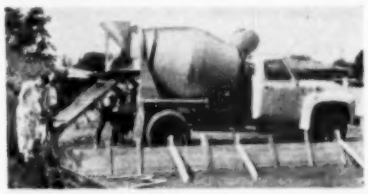


Austin-Western New Hydraulic Crane

propelled and hydraulically operated. Four functions are involved: turntable rotation, boom elevation, raising and lowering of cable and hook, and power extension and retraction of the boom. All movements, including steering, are actuated by hydraulic power. The crane has a 360° boom rotation, 24-ft. horizontal reach from center of rotation, 24-ft. vertical lift from ground level to hook, ability to negotiate grades up to 20 per cent, under full load, and 15 mph. road speed, under full load. The crane's over-all height is 9 ft. and over-all width 8 ft. Austin-Western engineers are now planning truck-mounted applications for production in the near future as well as a complete line of attachments, including clamshells, magnets, fork lifts, loaders, bulldozers and snowplows.

Truck Mixers with Power Take-Off

Challenge truck mixers are now available with power take off on the 3 and 3½ yd. sizes, according to an announcement by Cook Bros. Equipment Co., 3334 San Fernando Road, Los Angeles 65, Calif. The new feature is stated to permit full, legal rated payload capacity on shorter wheelbase on standard or cab-over-engine trucks. Another feature is the ease of maneuvering in cramped quarters and around building forms. Power is taken from the truck transmission, and permits easy shifting of gears while the truck is in transit. The power take off has a high



Challenge Truck Mixer with Power Take Off

and low gear which permits a wide range of operating and discharge speeds. Charging and discharging of the load is controlled from either the normal position at the rear of the mixer or from the driver's position in the truck cab.

More footage per day...
More footage per blade...
LOWER COST PER CUT!

Felker DI-MET
MODEL 252
The heavy duty
CONCRETE CUTTER
that pushes itself!

CUTS MORE CONCRETE PER DAY BECAUSE THE MODEL 252 IS SELF-PROPELLED! OVERCOMES OPERATOR FATIGUE, ELIMINATES FREQUENT REST PERIODS, COVERS FAR MORE FOOTAGE IN A DAY!

★ LONGER BLADE LIFE—No sudden bumps and jolts to add unnecessary wear and tear on the diamond wheel. Smooth, uniform POWER FEED adds longer blade life—CUTS COSTS! Actual field reports have shown blade life as much as doubled.

★ DEEP CUTS—approximately 7" maximum with 18" blade. 13.5 h.p. engine furnishes power to spare.

★ DOUBLE END SPINDLE for right or left hand cutting.

★ HINGED BLADE GUARDS—Front half lifts, exposing blade for close-up work.

Ask your Felker DI-MET Representative for recommendations.

1924-1954

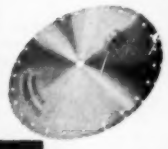
WORLD'S LARGEST AND OLDEST MANUFACTURER OF DIAMOND ABRASIVE CUT-OFF WHEELS AND MACHINES.

Celebrating our 30th Anniversary!

1954 commemorates Felker's 30th consecutive year of diamond abrasive wheel development and manufacture. You benefit from this unmatched experience when you specify Felker Di-Met!

Use DI-MET Machines and Blades for every concrete cutting requirement!

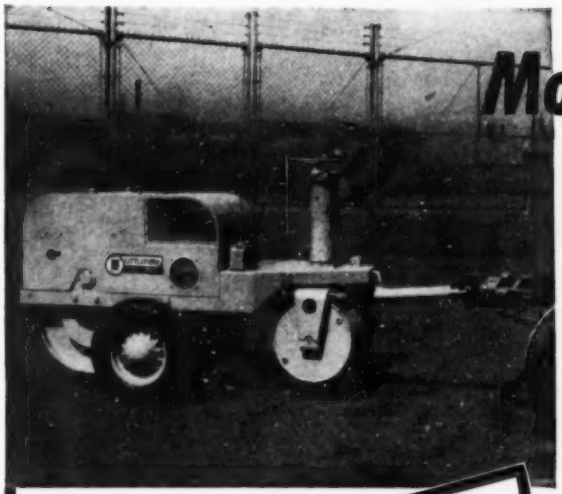
Here's an unusual application—sawing up and re-locating a concrete wall! Savings: $241.00 on a $991.00 job!



Felker DI-MET the SEGMENTED type diamond blade with peak performance! Built by the only manufacturer making both concrete cutters and diamond wheels. Bond variations for every cutting requirement insure more footage—lower cost per cut!

FELKER DI-MET

FELKER MANUFACTURING CO.
TORRANCE • CALIFORNIA



More Jobs Per Day by FAST TRAILING - - - Littleford MODEL 157 TRAIL-O-ROLLER

This Highly Portable Roller is a modern workhorse when it comes to rolling. New Contractors, Highway Departments, Park Departments and Cities can transport this 2 to 3 ton Roller to job after job in a single day. The 157 Trail-O-Roller has a Hydraulic Lift supplying power to change from rolling to trailing or trailing to rolling position and it takes one man less than five minutes to make the change. Model 157 is sturdy, easy to handle, compact and has plenty of power. This highly portable 157 Trail-O-Roller gives compaction from 75 to 160 lbs. by adding ballast to the front and rear roll. Model 157 will roll Highways, Streets, Roads, Runways, Parking Lots, Driveways, or wherever compaction is needed. Cost-saving features make this 157 Roller the most modern unit of its kind. Write for Bulletin No. 24.

LB LITTLEFORD
BLACK TOP ROAD MAINTENANCE EQUIPMENT
SINCE - 1900

LITTLEFORD BROS., INC.
454 E. Pearl St.
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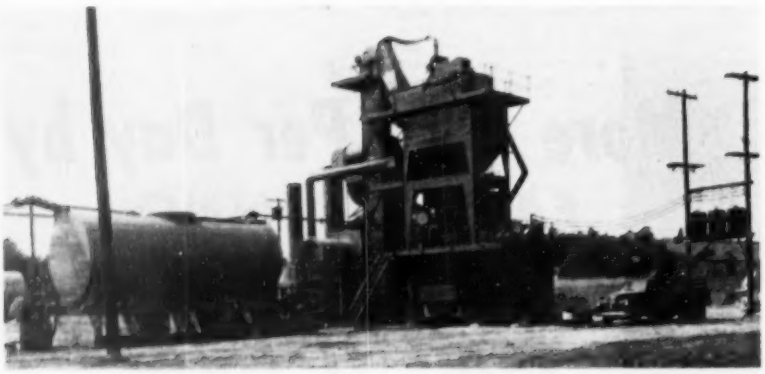


Type T-50 Tower Recently Installed for New Equipment Enterprise & Supply Co., New Enterprise, Pa.

Asphalt Plant Has New Features

A new type of mixing tower, announced by Hetherington & Berner, Inc., 700 Kentucky Ave., Indianapolis 7, incorporates several basic improvements and new features that are stated to make possible exceptional performance and maintenance records. The new H & B plant is known as the Type T. All bolts and rivets are eliminated, the structure is entirely welded. Much of the bracing and miscellaneous loose pieces have been done away with, through the use of advanced welded plate construction. These new plants are available with all units driven by individual electric motors and completely wired, with gasoline or diesel engines on the main units and electric drive on the smaller units, or with gasoline or diesel drive throughout. On the T-40 and T-50 models a new type Deister screen, which gives excess screening capacity where required, is also available. There are provisions for a fugitive dust system which collects dust ordinarily escaping from the elevator, screen, weighbox, etc., and a secondary collector can be provided to make the plant entirely dust free.

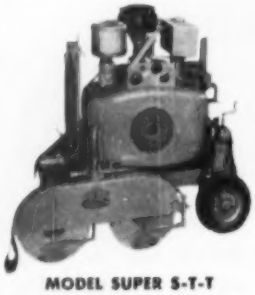
O'Hadi Patcher at Work

Pavements, no matter of what type, in due course of time require patching. Potholes, raveled edges, breakouts, sunken corner breaks, and many other types of failures to pavements and surfacings need small patches to prevent enlargement of the failure and to smooth up the surface. One of the tools or units of equipment on the market designed especially for accomplishing this job is what is known as the O'Hadi Patcher, a product of Buhl Machine Works, Buhl, Idaho. Essentially this tool heats and dries the hole or spot to be patched. Only enough patching material is used in the box, and turned over by hand shovel, to fill the individual hole or spot to be patched. Pre-mixed bituminous mixture is employed in the box of the O'Hadi Patcher. After the material is dumped into the hole to be patched, the tires of the truck, which the patching crew uses, are employed for rolling the patch.

The degree of success of the O'Hadi Patcher depends entirely on the man or men who operate it. Shiftless, careless handling will produce poor patches with the O'Hadi Patcher as with any other method of patching. It takes a day or two to acquire the knack and sequences necessary to good fast patching.

Workman heating and working premixed patch material in the O'Hadi Patcher, using a cut-down shovel for turning the mixture in the box.

Bottled gas, used for heating, is attached to the rear end of the truck being used.



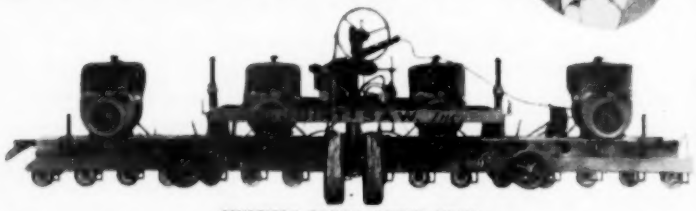
CUTCRETE

Trail Blade CONCRETE SAWS

BY THE ORIGINATOR OF MOBILE CONCRETE SAWS — HURST LEWIS

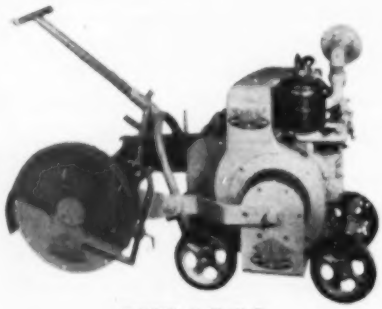
MODEL SUPER S-T-T

A tandem trailed step cutting machine with 26 h.p. engine.



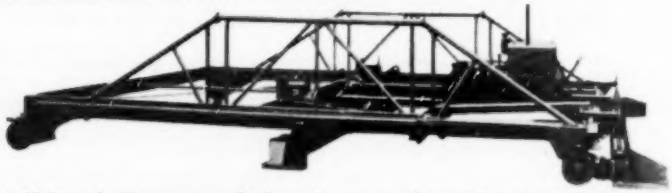
MULTIPLE BLADE JOINT SAW

A multiple-blade concrete saw for sawing weakened plane joints in highways and airport runways, widths from 10' to 25'.



MODEL A P H D

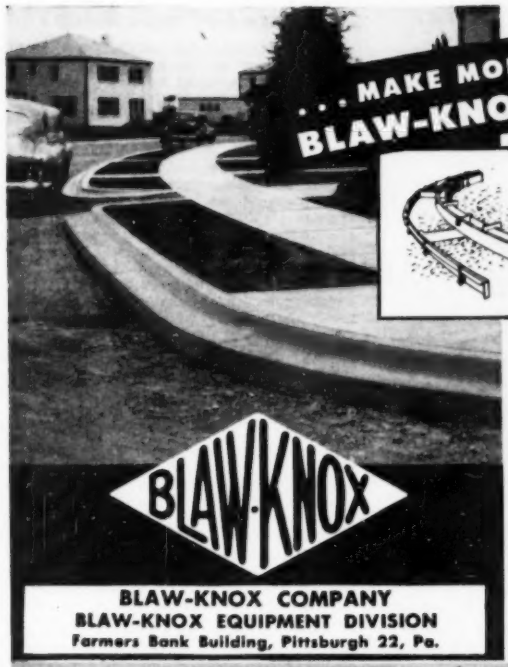
The all-purpose heavy-duty saw equipped with 14 h.p. engine. Saws either direction.



A 25-foot wheelbase concrete finisher with rear screed suspended midway between the two axles.

WRITE OR CALL TODAY FOR MORE INFORMATION ON CONCRETE SAWING, FINISHING AND BREAKING . . . . .

CUTCRETE CORP., Pasadena 8, Calif.



. . . MAKE MORE PROFIT ON JOBS LIKE THIS WITH
BLAW-KNOX CURB AND GUTTER FORMS

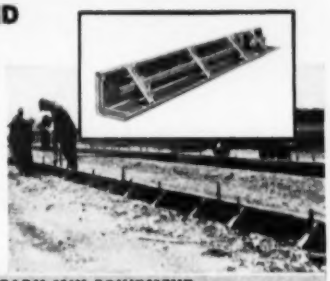
WHATEVER kind of street paving work you have, from curved or serpentine shapes to simple straight work, Blaw-Knox Steel Curb and Gutter Forms make money on every job. Easy to set and strip, they complete the job faster and well within your estimate. Costly hand finishing is eliminated. You not only save on materials and carpentry labor, but finished jobs have a perfection impossible to achieve with wood forms. The same forms can be used over and over for a wide variety of work. Ask your Blaw-Knox distributor about the "Complete Package" of Steel Forms for low-cost construction of concrete curb, curb and gutter, integral curb and sidewalk.

BLAW-KNOX

BLAW-KNOX COMPANY
BLAW-KNOX EQUIPMENT DIVISION
Farmers Bank Building, Pittsburgh 22, Pa.

BLAW-KNOX ROAD AND AIRPORT FORMS

You can be sure of more rapid form setting, *always true to line and grade,* with Blaw-Knox Heavy-Duty, Self-Aligning Steel Forms. Available in heights of 8" or more, or in Dreadnaught Forms when less than 8" height is required. Heavy-Duty 12" x12" Forms and Airport Paving Forms in sizes above 12" are designed especially to meet the thicker paving slab requirements of modern airports.



ASK ABOUT THE BLAW-KNOX *"Complete Package"* OF CONCRETE PAVING AND READY-MIX EQUIPMENT

HI-BOY TRUKMIXERS

AGGREGATE BATCHING PLANTS

CONCRETE SPREADER-VIBRATORS

FINISHING MACHINES

New Truck Has Steering Pusher Axle

A new model White truck for the construction industry that has already gained a special name, "The Centipede," has been developed by The White Motor Co., Cleveland 1, O. The first of these new units with steering pusher axles have been placed in service for the W. E. Anderson Sons Co., Columbus, O. The new White "Centipede" (Model WC-2284) transport a 5½-yd. transit-type mixer. They are equipped with power steering and two-way radio communication. They have 9.00 x 20 tires on front and pusher axle wheels and 10.00 x 20 road-lug tires on tandem axle wheels. All 12 tires have puncture-proof tubes. This new White has a wheelbase of 165 in. from the center line of front axle to center line of third axle. Road tested during three months of all-round service for the Anderson Co. operations in Central Ohio, the new model White "Centipedes" are stated to have a number of definite advantages including a payload advantage and load tolerance that is particularly helpful. The steering pusher axle adds better weight distribution and flotation within state weight limitations. Fully equipped and ready for the load, the "Centipedes" can handle 24,000 lb. payload and 100 gal. of tank water within state limitations, with their weight distribution as follows: front axle—8,580 lb., steering pusher axle—9,000 lb., and tandem axle—31,290 lb.

The "Centipede" Model WC 2284 White Truck

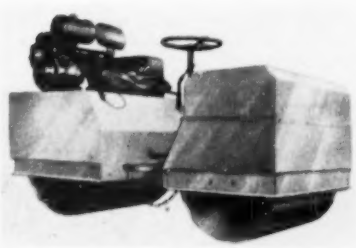
Hydraulic Tractor Shovel

A new hydraulic tractor shovel has been added to the earth mover line of Henry Manufacturing Co., Inc., 1700 N. Clay St., Topeka, Kan. It has the same reservoir pump, valve and cylinder systems as used on the company's backhoes. The pump is front-mounted, with anti-friction bearings. The simple, self-centering control valve has one lever for lift and one for dump. The cylinders are arc-welded to the trunion, with replaceable bronze bearings. Cast iron pistons, with non-metallic rings, minimize scoring and assure a tight seal. Extra large bronze packing glands reduce wear and hold the chevron packing in place. A packing gland wiper keeps foreign matter out of the cylinders. All cylinders are steel tubing, honed to 20 micro finish. The tractor shovel is all-steel construction, all electric-arc welded, all Henry-made throughout.

New Henry Tractor Shovel

One Ton Roller Designed for Maneuverability

A newly designed 1-ton Motoroller having 56 lb. per square inch compaction has been announced by Gabb Special Products, Windsor Locks, Conn. In the design of this roller special emphasis has been placed on maneuverability as well as ease of transportation from job to job. Some of the features of the new one-ton Motoroller are a newly designed center poise hook-up which insures perfect tracking of the front and rear rolls; geared steering through a split front drum; low center of gravity for working on grades and slopes; compact frame structure with a minimum of overhang on sides for close rolling; water ballast drums to permit weight variance; dual drain plugs for speedy filling and draining; Wisconsin air cooled engine, providing a smooth flow of extra power; and proven heavy duty forward-reverse transmission with external adjustments—all designed for maximum efficiency and convenience of operation.



New 1-Ton Motoroller

THROW and SPREAD
***or* ROLL and WINDROW**

WITH A **FRINK ONE-WAY**

The contour of the moldboard makes this versatile plow effective at all speeds. It is designed to cut under the snow, and raise it above the adjoining snow. At high speeds, the plow will throw and spread the snow without forming deep side banks which would encourage drifting. At slow speeds it rolls the snow, and at very slow speeds the plow neatly rolls and windrows the snow.

This Sno-Plow has two shock absorbing connections between the moldboard and Drive Frame Assembly so that the cutting edge springs up and back when an obstruction is encountered. The cutting edge immediately returns to working position as soon as the obstruction is passed. This cutting edge is reversible to provide double wear.

Frink Reversible Type, One-Way Type, V-Type Sno-Plows and the Frink Roto-Broom are interchangeable on the same truck attachment.

For further information on this Sno-Plow write for catalog to nearest address, Box RS541

FRINK SNO-PLOWS

FRINK SNO-PLOWS, INC., CLAYTON, NEW YORK
DAVENPORT-BESLER CORP., DAVENPORT, IOWA
FRINK SNO-PLOWS of CANADA, LTD., TORONTO, ONT.

New Pole Grip

A completely new patented tool for setting up power poles through energized power lines is now in production by Peterson Engineering Co., Mfrs., Santa Clara, Calif. This new tool, known as pengo pole grip does not replace the peavey; but does a different job. It enables one man to have complete control of the butt of the pole to safely guide the top of it up between power lines and therefore, it not only eliminates one man, but is a safety tool as well.

Pengo Pole Grip

4-Cylinder Diesel Engine

A new 4-cylinder 78 hp diesel engine has been added to the line of Sheppards Diesels, Hanover, Pa. The new diesel, designated as Model 16, incorporates all the exclusive Sheppard simplified fuel injection system. Sheppard super-sensitive fly ball type governor, Sheppard positive oil spray cooled pistons. With the Model 16 full-flow filtration lubrications system, it is claimed, every drop of lubricating oil first passes through the filter before going to the bearings. Location of the lubricating oil filter in the crankcase is a feature of the new Model 16 claimed to simplify servicing.

Arm-Type Hydraulic Hoists

Two completely new arm-type hydraulic hoists for on or off highway application have been announced by Gar Wood Industries, Inc., Wayne, Mich. Both the Wayne, Mich., and Richmond, Calif., divisions will manufacture the model 2825 and 2025 hoists with 25 and 30 ton payload capacities. These hoists feature 70° dump angles to assure quick, sure clean-out dumping, even with sticky materials in scoop-end bodies. Features of the new hoists include clevite type bushings at all pivot points and cylinders that open at both ends. Sandwich construction of the new three-piece hydraulic pumps provided with the hoists permits precision manufacturing for high capacity without slippage. Parts are interchangeable without hand fitting or use of shims for simple maintenance in the field.

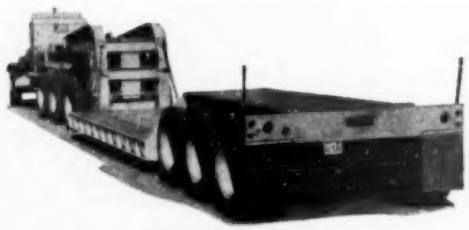
Non-Electric Magnetic Sweeper

A newly designed non-electric magnetic road sweeper is now offered by CESCO, Div. 24, Santa Rosa, Calif. Heart of the sweeper is its set of Alnico high intensity magnets with a lifetime magnetic service guarantee. Available in standard sweeping widths of from 4 to 8 ft., these sweepers are supported on cold rolled steel frames with 16 in. heavy duty road-type wheels mounting pneumatic tires. Wider models are available on special order. The complete sweeper includes stainless steel magnetic plate covers that dump collected tramp iron into the built-in retainer pans. This operation is easily and quickly accomplished by a manually operated worm gear that serves to rotate the magnets to the discharge position. The stainless steel covers are then swung up.

Non-Electric Magnetic Sweeper

Triple Axle Trailer Has 26 Tires

Newest development of Rogers Brothers Corporation, Albion, Pa., is a triple axle low-bed trailer. The rear has 12 tires mounted on three axles so designed as to provide free oscillation to distribute the load. At the front is a goose-neck dolly mounted on an axle with four tires. Thus, when used with a dual axle trailer the weight of the tractor, trailer and load is distributed over seven axles and 26 tires. This trailer is available in several capacities with conventional gooseneck or the Rogers power-lift detachable gooseneck which permits detaching, loading and reattaching in as little as five minutes.



Rogers Triple Axle Trailer

1954 Line of GMC Trucks

More than 100 engineering and styling changes are incorporated in the 1954 line of trucks of GMC Truck & Coach Division, Pontiac 11, Mich. The major product developments include: Utilitarian beauty in styling, for the first time in the trucking industry, a 125 HP engine in the light GMC's, stated to be highest 6-cylinder horse-power rating in the industry for this class, hydra-matic drive for medium and heavy-duty trucks and highway tractors, power steering, five new heavy-duty models, all featuring a 72-in. bumper-to-back-of-cab dimension to meet most economically over-all length laws in all states, silent power muffler, which eliminates objectionable exhaust noise.

1954 GMC Pickup Truck Has 125 HP Engine

Grader Attachment for Cutting Road Slopes

A new motor grader attachment claimed to have unusual advantages as a time and labor saver has been introduced by Hasselbach Flintzell Co., 215 N. 12th St., Omaha, Neb. Engineered to eliminate expensive road reshaping by hand, the Grade-More slope grader is stated to cut perfect fore-slopes and shoulder lines (in one operation) while the motor grader stays on top of the road. The 16-ft. mold board is suspended from the side of the motor grader and down the slope to cut

Grade-More Slope Grader

the road slope to any desired degree. It also adds yardage to dirt quantities by moving material from ditches to the top of the roadway. The mold board is controlled from the operator's seat through mechanical linkage with the regular motor grader controls.

Emergency Power Generators

A new group of 1800 rpm emergency power generators, designed to combat the crippling effects of a power failure, has been placed on the market by Katolight Corporation, 624 North Front St., Mankato, Minn. The generators range in sizes of from 2000 watts to 15,000 watts, and are easily belted to the ordinary farm type tractor or any other speed governed engine power. They develop the same 115/2300 voltage as supplied by the highlines and come in two designs: revolving armature and revolving field. The latter having a separate direct connected exciter, is particularly noted for its exceptional overload and motor starting ability. A standard pulley and panel complete with a voltmeter and rheostat can also be supplied along with necessary approved transfer switches.

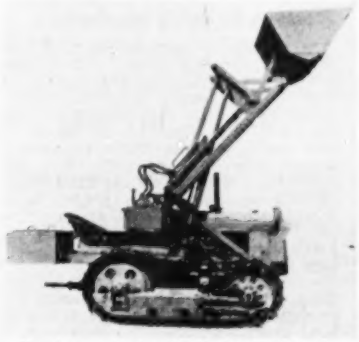
Pioneer Model 33R Crushing and Screening Plant

Crushing Plant Features Large Units on One Chassis

A new, single-unit rock crushing and screening plant designed for rapid production of aggregates from local quarries has been announced by Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis, Minn., subsidiary of Poor & Company, Chicago. The new plant, Model 33R, features the exclusive Pioneer triple roll crusher which enables two almost simultaneous passes at the rock. This feature in turn permits placing all units of the plant on one chassis for faster and more economical operation and "moves." Units of the plant are large enough for quarry work and include an 18 in. x 30 in. jaw crusher, an apron feeder mounted on the plant, a 1½-deck sizing and separating screen and a 30 in. x 18 in. triple roll secondary or reduction crusher. Weight has been kept to about 71,000 lbs. without power unit. Overall length (less towing hitch) is 45 ft. 10 in., moving height with apron feeder removed 12 ft. 6 in., and moving width 9 ft. 8 in.

Tractor Loader

A new loader has been announced by Henderson Manufacturing Co., Cedar Rapids, Ia. Specifically designed and built for the Oliver OC-3 Tractor, the Henderson hydraulic Model "F" loader has a bucket capacity of ½ yd. and is powered by a front end pump. Control of loader and attachments is claimed to be assured by the twin double action lift and bucket cylinders. The loader is equipped with automatic bucket-leveling device and bucket positioner which indicates the level of bucket to the operator on the tractor seat. No part of the loader is higher than the tractor when in digging position.



Henderson Hydraulic Model "F" Loader

Manufacturers' Literature

Tools and Accessories for Paving Breakers

A new bulletin listing its complete line of tools and accessories for paving breakers is available from Ingersoll-Rand Co., RD, 11 Broadway, New York 11, New York. A 2-page spread covers the various units of the Ingersoll-Rand paving breaker line with illustrations and specifications. The following seven pages cover the line-up of tools and accessories available for paving breakers. Each tool or accessory is illustrated and its recommended applications listed. A table of weights, sizes, etc., is also presented with each illustration. Last, but very important, is a page containing specific instructions for reforging and rehardening moil points, chisels, wedgepoint, etc. Instructions are given on procedure and specific temperature and temperature colors are listed.

Portable Asphalt Plant

The new Madsen Model 481 portable 4000 lb. batch capacity asphalt plant is illustrated and described in a 16-page catalog, available from Madsen Iron Works, Inc., P. O. Box 578, Norwalk, Calif. The various features of the plant are pictured and described and basic specifications for each are given. The plant is designed to give a faster charge-mix-discharge cycle, greater accessibility, easier maintenance, and the ultimate in portability. All units are within legal road widths and may be readily transported by truck tractor on their own rubber tires or by truck and trailer.

Steel Light Poles

A new 14-page catalog on Carco steel light poles, released by Pacific Car and Foundry Co., Renton, Wash., contains complete specifications of the standard anchor base and transformer base poles and brackets, as well as details on their important exclusive features. Cutaway and exploded views give a comprehensive picture of component parts together with erection data.

BREAK BLACKTOP QUICKLY

Back-Rippers on a "Caterpillar" D-6 Tractor being used effectively for street repair work. Insert shows Back-Rippers on Angling Blade Bulldozer.

These Preco Back-Rippers make quick work of breaking up black-top.

Welded to the reverse side of the bulldozer moldboard (underside of "C" Frame on Angling Blade Bulldozers) they R-I-P while the tractor backs up, then float on top of the ground on the forward trip.

They will speed up all your dozing jobs because they break up blacktop, hard ground, rocks and roots, making it easy for the tractor to get a full load on every trip. Available for "Caterpillar" Straight, "U" and Angling Blade Bulldozers.

See your "Caterpillar" dealer or write us for information

PRECO
INCORPORATED
6300 E. SEAUSON AVE., LOS ANGELES 22
CABLE ADDRESS: PRECA

Lorain Model 820-K Shovel-Crane

The versatile Lorain Model 820-K shovel-crane, with its long crawler, is covered in a new two-color, 24-page catalog released by The Thew Shovel Co., Lorain, O. Fully illustrated, it contains detail views of the operating mechanisms of the crawler, turntable and front end equipment, and explains fully the air controls incorporated in this machine and the operation of the hydraulic coupling which is standard equipment on this model. It covers features, performance information, and gives many action views of the 820-K being used as a 2-yd. shovel, clamshell, hoe, dragline and crane. Also, one section is devoted to the long range stripping shovel boom and its features and another to the crane boom and its accessory equipment, which includes steel erector's boom hoist, third drum attachment, vertical gantry, high speed boom hoist, precision boom lowering device, third drum and precision power load lowering attachment and the boom tip extension.

Tank Car Heaters, Bituminous Boosters

A new 4-page bulletin, Form AD-109, covering its complete line of tank car heaters, bituminous boosters, peak-temp oil boosters, deuce-combination tank car heaters and pumping boosters, and mobile, portable and stationary boilers has been issued by the Cleaver-Brooks Co., 326 E. Keefe Ave., Milwaukee 12, Wis. The bulletin contains illustrations of the products in use along with brief descriptive copy and specifications. Typical installation pictures show the use of these Cleaver-Brooks units for heating, for pile driving, for bitumen and road oil heating in tank cars and storage asphalt plants, for ready mix concrete plants, aggregate drying, cold weather construction operation and the curing of concrete block and concrete cast products.

Handling and Placing Concrete Efficiently

A new 56-page manual on handling and placing concrete has been issued by Gar-Bro Manufacturing Co., 2415 East Washington Blvd., Los Angeles 21, Calif., as a guide to the latest improved methods. It is a condensed handbook which covers all phases of concrete construction methods from the selection of concrete through the batching and placing procedures. The booklet provides complete check lists of job specifications, job conditions and equipment. It lists the available current technical data, includes many useful tables, illustrates correct and incorrect placing methods, and shows unusual jobs and how they were solved. References to proper equipment are made throughout the manual.

Modern Logging Methods

A new 2-color photo-album type market catalog, "Logging With Allis-Chalmers" has been published by the Tractor Division, Allis-Chalmers Manufacturing Co., Milwaukee 1, Wis. The catalog directs attention to the versatility of crawler tractors, motor graders, motor scrapers, and power units, with approved allied equipment. The booklet outlines advantages of mechanized operations made possible through the use of modern equipment. New and speedier methods of handling jobs such as building and maintaining access roads, reforestation and work at the sawmill, are spotlighted by the illustrations. Stressed also is the economy factor provided by such things as operator comfort, expanded output of each unit, and less "down time" while on the job.

Asphalt Plants

A new 36-page catalog (No. 848) illustrating all of the components of their high capacity Model 848 series asphalt plants, has been released by Barber-Greene Co., 400 North Highland Ave., Aurora, Ill. The catalog shows how all of the basic plant components, the mixer, the dryer, the gradation control unit, the dust collector, accessory feeders, elevators and other units, can be combined into four separate plant set-ups, each designed specifically for a popular application. The catalog features a three-color, two page phantom view showing the "inside story" of operation of the entire high type plant from the accurately controlled cold aggregate feed-through the mixer. The four set-ups are: 1. The high type plant where complete four bin separation and screening after drying makes possible the production of any type of high-type hot bituminous mix, with capacities from 100 to 150 tons per hour. 2. The cold aggregate control plant, with a capacity range up to 160 tons per hour. Here 2, 3 or 4 bin proportioning of aggregate sizes is provided in the cold feed. 3. The stabilization plant, where only the mixer is employed, producing cement stabilized and similar base materials with a capacity up to 300 tons per hour. 4. The travel plant in which the mixer is towed by a bucket loader for highest quality road-mix applications. The capacity range is from 100 to 250 tons per hour.

Cost Record Book for Trucks

The annual Autocar cost record book is now ready in its 32nd annual edition and can be obtained from The Autocar Division, The White Motor Co., Ardmore, Pa. The book provides a simple and accurate system for keeping a record of operating cost for each vehicle in a fleet. It is given, on request free of charge, to all heavy duty truck operators whether or not they operate Autocar trucks. Simple one-page instructions for use of the 12 double-page monthly record sheets included in the book enable any motor truck owner to eliminate all guess-work from operating and maintenance expenses. An operator keeps one book on each of the vehicles in his fleet. Space is provided for a truck's daily record of miles traveled, of trips, units (tons, gallons, etc.) carried, unit miles, driver's and helper's wages, the quantity and cost of gasoline, oil and grease used, the cost of garage labor, repair parts, tires and tire repairs, garage supplies, depreciation, interest, housing insurance, taxes, painting and washing. A double column provides for comparison of actual and estimated costs.

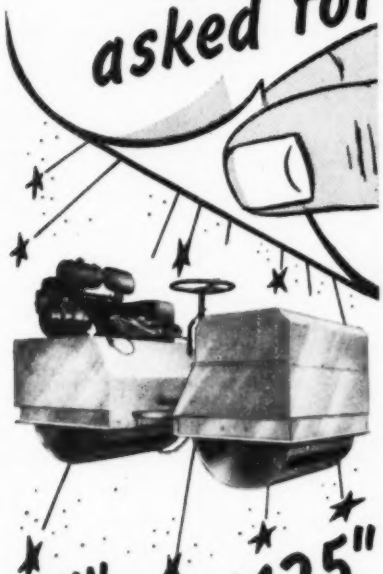
Rust Prevention

A new 1954 general catalog on rust prevention has been issued by Rust-Oleum Corporation, 2799 Oakton St., Evanston, Ill. The catalog features 94 color chips of Rust-Oleum products and includes complete instructions for surface preparation and application of Rust-Oleum primers, short oil type, long oil type, machinery and implement finishes, chemical and heat resistant types, sealers, oil field finishes, thinning oils, and floor and masonry coatings. Full explanations are given on all problems relating to the surface preparations and applications of Rust-Oleum products.

Details of Cat D7 Tractor

The new oil type clutch along with 45 other operating details of the Cat D7 tractor are described in Form 39377 issued by Caterpillar Tractor Co., Peoria 8, Ill. Included is a detailed specification sheet and a detailed cutaway illustration of the tractor.

Here's the Power Roller YOU asked for



NEW MODEL "125" MOTOROLLER

56 psi effective compaction

★ WEIGHT RANGE 1500-2400 lbs.

★ 6 H.P. AIRCOOLED ENGINE

★ LOW CENTER OF GRAVITY

★ EXCLUSIVE FEATURES

- Center Poise Steering
- Unequalled Maneuverability
- Absolute Tracking of Rolls

For further information — write

Gabb Special Products

WINDSOR LOCKS, CONN

Protective Coatings Based on Chlorinated Rubber

Thirty-five case histories of the successful use of protective coatings based on chlorinated rubber are included in a 20-page booklet "Protection With Parlon," issued by Hercules Powder Co., Wilmington, Del. Water and sewage works, paper mills, storage tanks, and chemical and food processing plants are among the installations where Parlon-based coatings have been photographed after long-term exposure to a variety of corrosive environments. Also included in the booklet are performance data on Parlon finishes and instructions for applying Parlon paints by brush or spray to metal, wood and various cement and asphalt surfaces.

Service Chart for Adjusting Shim-Type Clutches

A 3-ft. by 2-ft. service chart, available from Lipe-Rollway Corporation, 712 Emerson Avenue, Syracuse, N. Y., describes eight important steps for adjusting shim-type clutches. Five large photo-illustrations supplement detailed information on how to check dimension "A," block clutch pedal, loosen adjusting nuts properly, remove shims, reblock clutch pedals, tighten adjusting nuts firmly and check clearance between clutch release sleeve and clutch release bearing. It also lists in chart form the model numbers, quantity of shims, and dimension "A" and facing thickness measurements for 166 different Lipe heavy-duty clutch models.

Hydraulic Booster Units Make Steering Easier

Garrison hydraulic booster units that are claimed to reduce steering efforts approximately 80% are explained in a 4-page circular issued by Garrison Manufacturing, 1500 South Santa Fe Ave., Los Angeles 21, Calif. These units, attached to the conventional steering linkage, are stated to automatically take the work out of steering. Garrison power steering is stated to be widely used on all types of light and heavy trucks, truck cranes, motor graders and off-the-road equipment.

Long-Scale Switchboard Instruments

A new 24-page bulletin on long-scale switchboard instruments is available from the General Electric Co., Schenectady 5, N. Y. Designated GEC-218C, the publication contains a description of the company's AB-DB-18 and AB-DB-16 instrument lines as well as principles of operation, characteristics, and specifications. Prices and dimensions also are provided.

Manganese Steel Replacement Parts

A new bulletin, No. 1051, covering Oro manganese steel replacement parts for the sand, gravel and crushed rock industries is available from Kensington Steel Co., 505 Kensington Ave., Chicago 28, Ill. Replacements listed include crushing surfaces for hammermills, disintegrators, roll, jaw, gyratory and cone crushers, chains and links, dipper points and treads.

Clamshells, Material Handling Buckets and Grapples

Three new folders on Owen buckets have been published by The Owen Bucket Co., Breakwater Ave., Cleveland, O. One covers the clamshell buckets, another covers material handling buckets, and the third covers grapples. The buckets are illustrated and described and tables of ratings, dimensions and weights for each type of bucket are given.

The TRUE-LAY PAVING MACHINE Makes More Money for You

Contractor Earl P. Lindquist says: "Since getting my TRUE-LAY, I have discovered that there is no more guesswork when ordering materials. I can now estimate the exact amount of material needed for any given job, and have no more wasted overages, or loss of time wating for extra material."

Check These Outstanding Features:

- Accurate Estimating of Needed Materials
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- Fewer Men, Fewer Hours, More Footage
- Smooth, Level, Compact Paving

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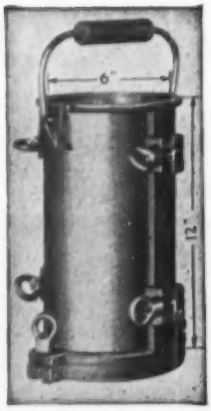

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CONCRETE TEST CYLINDER MOLDS

You can produce accurate test specimens to exact measurements with Moline Molds. They meet all ASTM requirements and are virtually indestructible—because they are made of refined malleable iron. Portable for laboratory or field work. Various sizes available including standard 6" x 12" Model A (illustrated). Remember—a test is only as good as the specimen.

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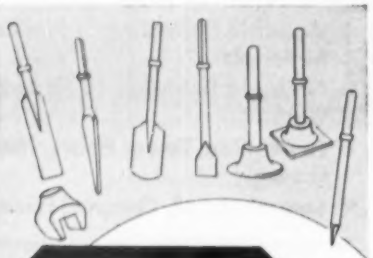

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ROCKLAND, MAINE

Tailgate Bituminous Mixer

The new Model 30 Heat-A-Mix is covered in a circular issued by Wylie Manufacturing Co., Inc., 5926 N. W. 39th, P. O. Box 7086, Oklahoma City, Okla. The Heat-A-Mix is a compact high capacity pugmill and material heater, mounted on a tailgate panel, which can be quickly attached to a dump truck ready for maintenance operation. It is self-contained with its own gasoline engine, and propane heating system. The stockpile or blade-mixed asphalt, carried on the dump truck, is charged into the heat-jacketed charging hopper, pre-warmed and dumped into the hot pugmill. The asphaltic material is thoroughly heated and mixed in the pugmill before discharging into the material catchpan or onto the road surface.

Air Vibration Equipment

A 16-page catalog describing its line of air vibration equipment, including metallic-impact types and air-cushioned vibrators which operate with a minimum of noise, has been published by The Cleveland Vibrator Co., 2828 Clinton Ave., Cleveland, O. Operating photos show vibrators in use by a wide variety of industries, construction, railroads, metalworking plants, concrete and foundry facilities, mines and many others. The Cleveland line includes 29 mountings and 14 piston diameter sizes, capable of producing a wide range of vibration intensities.

York Rake Reduces Hand Labor

A 4-page catalog on its York rake is available from York Modern Corporation, Unadilla, N. Y. Illustrations are shown of the rake on construction and maintenance jobs and general specifications are given. The rake and its operation are described. The rake can be used with a power grader or can be drawn separately by truck, tractor or jeep. When used with a power grader the rake redistributes the windrow, removing large stones in a single operation. The small stone along with other fine material pass through the rake teeth and remain on the road bed.

Welding Guide

A new 32-page "DirectoRod Guide," published by the Eutectic Welding Alloys Corp., 40-40 172nd St., Flushing 58, N. Y., gives recommendations for over 300 types of metal joining operations. There are over 40 illustrations of practical applications taken from case history files and there are 12 pages of easily followed charts. The booklet is divided into sections, each dealing with a specific base metal. At the end of each section is a chart listing the electrodes, alloys and fluxes which may be used on the various types of base metal.

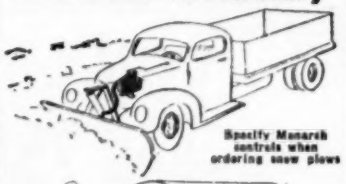
New Ideas in Wire Rope Slings

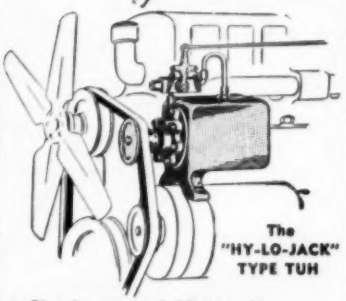
"New Ideas in Red-Strand Slings" is the title of a new folder published by Leschen Wire Rope Division, H. K. Porter Co., Inc., St. Louis 12, Mo. It fully describes the new line of red-strand multiple part slings and the money-saving pin-lock thimbles. The folder also describes new red-strand single-part slings equipped with single-swaged fittings, in addition to red-strand grommet slings.

Methods of Joining Sewer Pipe

A 20-page booklet describing modern methods and materials for joining sewer pipe has been issued by The Atlas Mineral Products Co., Mertztown, Pa.

POWER HYDRAULICS for Snow Plows and Road Machinery





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GRAND RAPIDS 4, MICHIGAN

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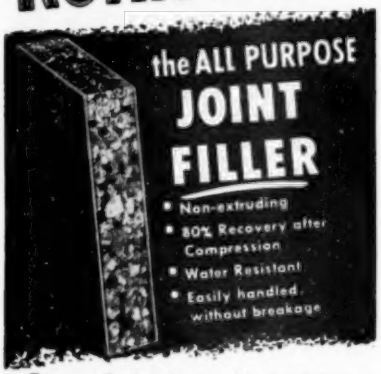

Composed of cork granules bonded together with asphalt between two sheets of heavy asphalt-saturated paper, KORK-PAK is the lowest cost, non-extruding joint filler on the market. KORK-PAK is readily handled without breakage . . . and when used in conjunction with Para-Plastic Joint Seal, always provides complete joint filling and protection.

Write for details and prices on KORK-PAK. Catalog sent without obligation.

*KORK-PAK *is one of the many Patented products developed for the Construction Industry by Servicised Products Corp.*

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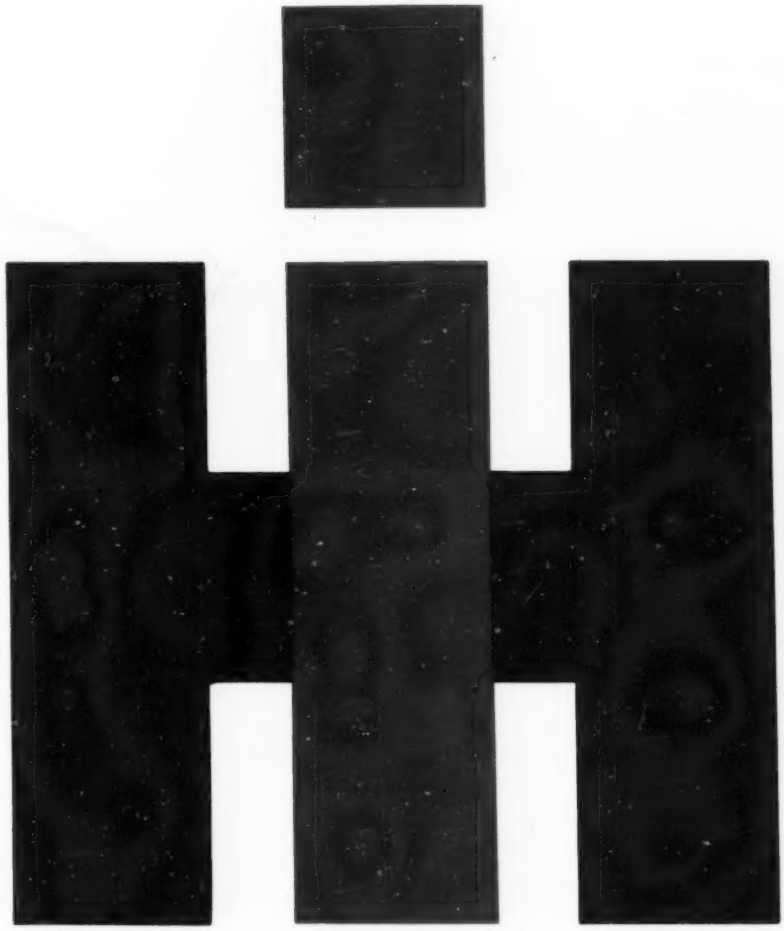

International Harvester and INTERNATIONAL Industrial Distributors present a complete line of modern earthmoving equipment, led by the INTERNATIONAL two-wheel, rubber-tired tractors with scrapers, and by "Big Red," the INTERNATIONAL TD-24, world's most powerful crawler

INTERNATIONAL HARVESTER

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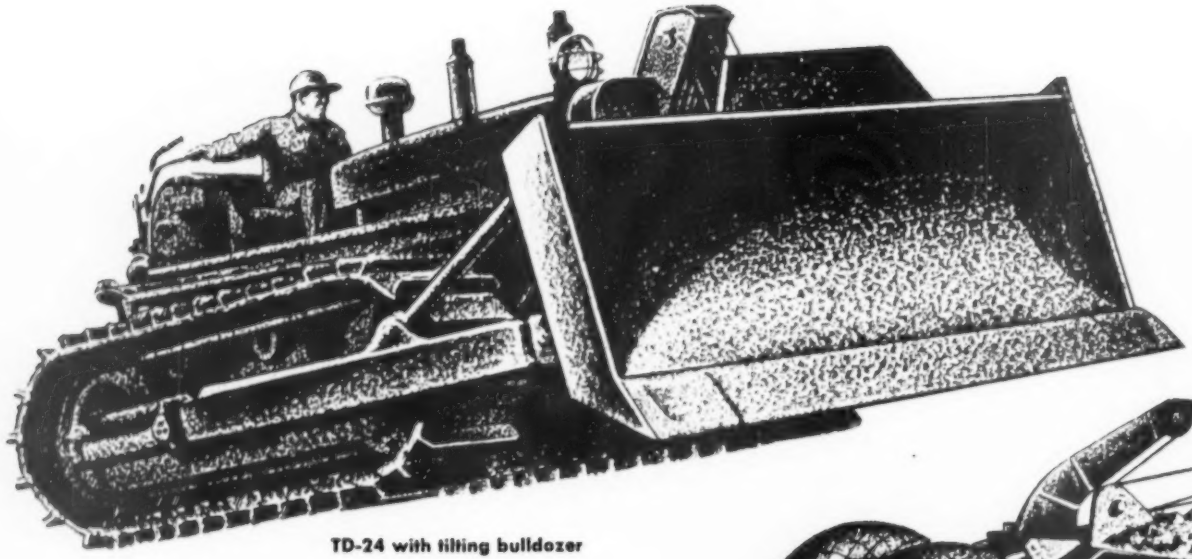
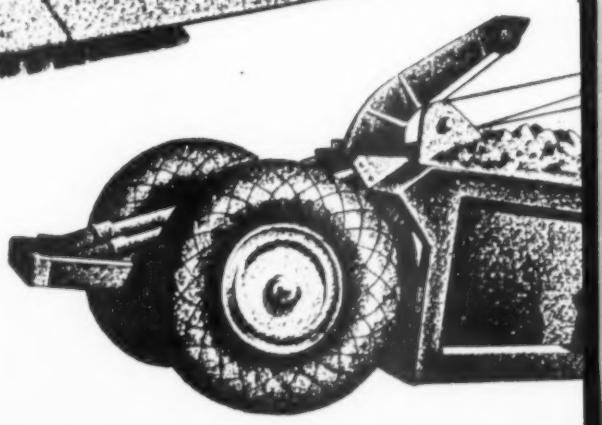
Two sizes of two-wheel, rubber-tired tractors and scrapers

Now a complete earthmoving line that comes in the



TD-24 with tilting bulldozer



Two-wheel, rubber-tired tractor with wagon

Big Red Package

Got a big job to do? Call on INTERNATIONAL'S new Big Red Team!

- Seven rugged crawlers headed by the TD-24—most powerful crawler on the market!
- Twenty-two matching hydraulic and cable-controlled bulldozers and bullgraders, with land-clearing blades available!
- Four 4-wheeled scrapers!
- Two high-speed, two-wheel, rubber-tired tractors with scrapers (13 and 18 heaped-yard capacity)!
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These great machines, now grouped under the INTERNATIONAL banner, have proved their dependability and economy to contractors for years on big projects around the world.

Your INTERNATIONAL Industrial Distributor has the equipment that will help you make a profit on any job you tackle. Call him for full details . . . or for actual demonstrations. See for yourself!

POWER THAT PAYS

INTERNATIONAL HARVESTER

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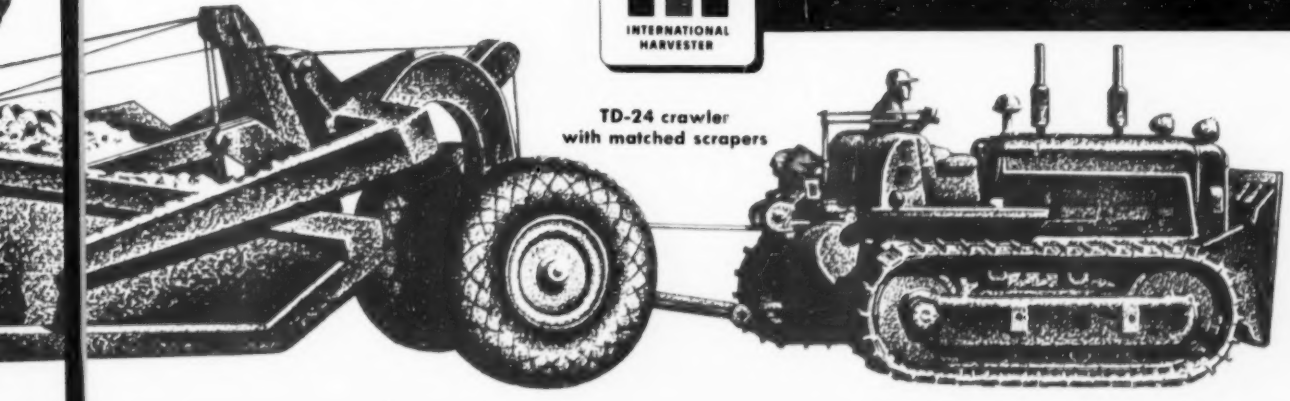

TD-24 crawler with matched scrapers

Now All in One Family

the hardest-working work teams in the world!

The new INTERNATIONAL team stars not only a full line of rugged red INTERNATIONAL crawlers, complete with INTERNATIONAL scrapers and bulldozers, but also high-speed INTERNATIONAL two-wheel, rubber-tired tractors with scrapers.

This means that now, more than ever, your INTERNATIONAL Industrial Distributor is "Earthmoving Headquarters" for your area. He offers you IH equipment to tackle any job, backed up by unsurpassed service facilities and parts supplies.

He's at your call, always, to help keep your equipment rolling . . . to cut down your down-time and pile up your profit-time . . . to serve you with INTERNATIONAL "Power that Pays!"

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS

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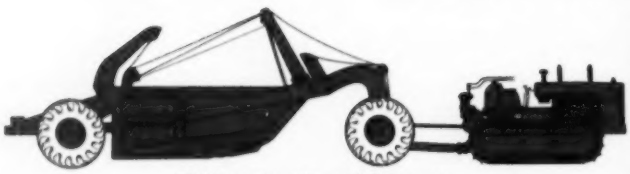
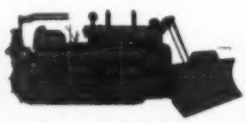
POWER THAT PAYS



TD-24 crawler with matched scrapers

TD-18A crawler with matched scrapers



TD-24 crawler with bullgrader

TD-14A crawler with cable bullgrader

TD-9 crawler with hydraulic bulldozer

T-9 crawler with hydraulic bullgrader

TD-6 crawler with hydraulic bulldozer

T-6 crawler with hydraulic bullgrader

Model 2T-75 two-wheel, rubber-tired tractor with 18 heaped-yard capacity scraper

Model 2T-75 two-wheel, rubber-tired tractor with 20 heaped-yard capacity bottom dump wagon

Model 2T-55 two-wheel, rubber-tired tractor with 13 heaped-yard capacity scraper

Bituminous ROADS AND STREETS

Cover Scene

Processing bituminous road mix for 11 miles of State Highway 35 near Sweet Home, Arkansas. Freshour Brothers, contractor. Adams 100 hp. motor grader. Job included 40,000 cu. yd. of red clay gravel base material, 9,000 cu. yd. surface mix using MC-3 at 1.2 gal. per sq. yd.

Published by Gillette Publishing Company
22 West Maple Street, Chicago 10, Illinois

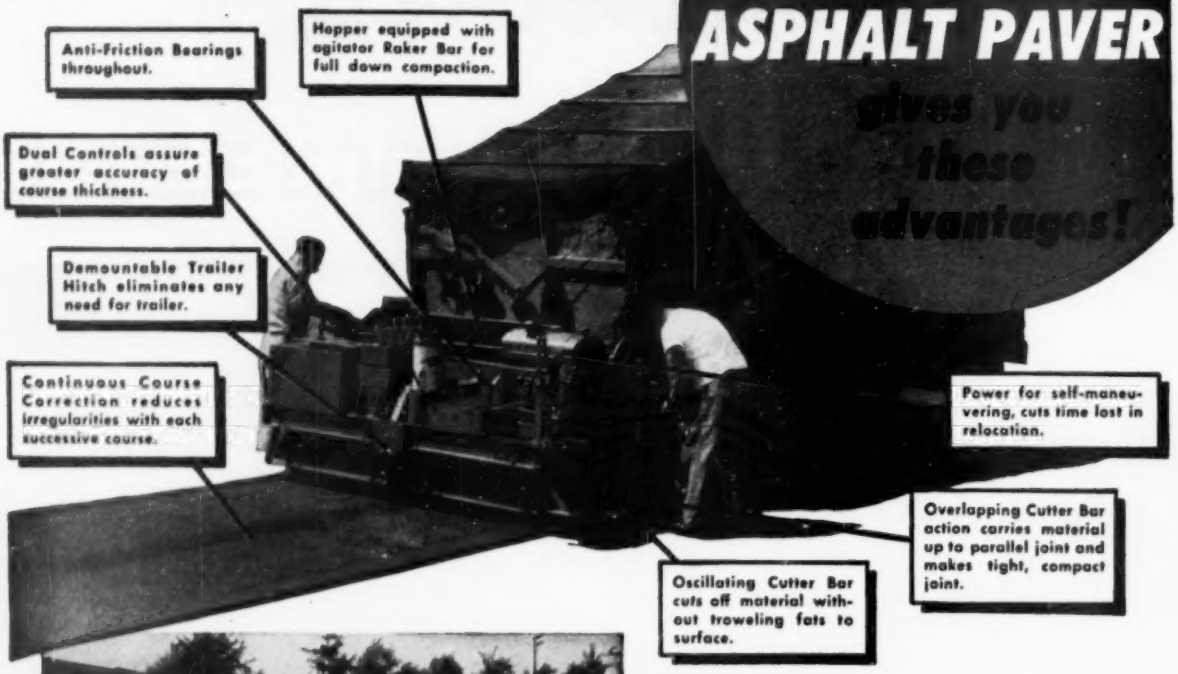
Pit Material Blended With Dozers

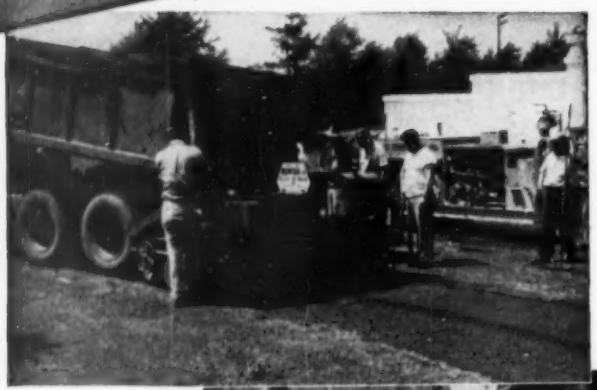
Nevitt Considers Spray Bars

Asphalt Technologists' Program

JANUARY, 1954

NO OTHER SMALL TOW TYPE ASPHALT PAVER gives you these advantages!


Anti-Friction Bearings throughout.
Hopper equipped with agitator Raker Bar for full down compaction.
Dual Controls assure greater accuracy of course thickness.
Demountable Trailer Hitch eliminates any need for trailer.
Continuous Course Correction reduces irregularities with each successive course.
Power for self-maneuvering, cuts time lost in relocation.
Overlapping Cutter Bar action carries material up to parallel joint and makes tight, compact joint.
Oscillating Cutter Bar cuts off material without troweling fats to surface.



PUTTING DOWN ROADWAY IN A LARGE CHICAGO CEMETERY.

LAYING A PARKING LOT IN NEW JERSEY

HERE, for the first time, is a precision Black Top Paver in a small package! The advantages listed above can be had in no other machine of this type. These advantages combine to give you a better job on those parking lot, driveway and playground contracts. They mean faster spreading, less time lost in relocation and greater accuracy of control. Look over these and the other Adnun advantages. Ask for details and plan on the new Adnun Jr. Model 8 for non-specification work.

ADNUN JR
MODEL 8
BLACK TOP PAVER

BLAW-KNOX COMPANY
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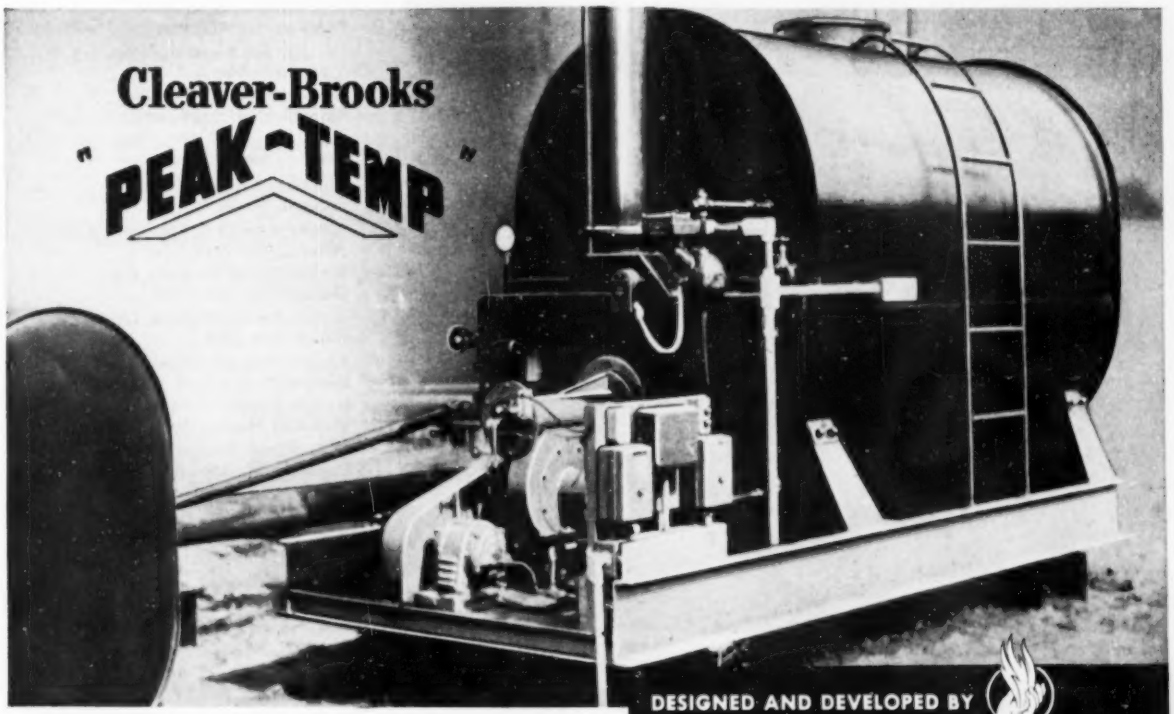
1936 State Street,
NUNDA, NEW YORK

BLAW-KNOX

NEW Oil Booster uses high-temp oil as heat transfer medium — eliminates water, steam and pressure problems



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Cleaver-Brooks

Builders of Equipment for the Generation and Utilization of Heat — Pioneers and Originators of Self-Contained Boilers, Tank-Car Heaters, "Deuce" and Bituminous Boosters

...gives you higher temperatures, faster, with lower fuel costs, less maintenance

"Peak-Temp" is the newest, quickest, lowest-cost way of heating oils, bituminous and heavy viscous materials in tank cars, storage tanks, bulk plants and refineries. By using a specially selected high temperature oil as the heat transfer medium, "Peak-Temp" gives you advantages never before possible in bitumin heating equipment. Look at this speed, economy and versatility!

HEATS TWICE AS FAST AS STEAM— "Peak-Temp" increases the temperature of bituminous materials at the rate of 25° to 30°F per hour. This is approximately twice as fast as with 150 lbs. of steam. Unit operates with oil at temperatures up to 600°F, without special pumps and fittings.

COSTS LESS TO OPERATE— "Peak-Temp" gives considerably more heat than steam unit using the same amount of fuel. What's more, "Peak-Temp" operates at atmospheric pressures, thus eliminating need for licensed engineer. Oil evaporation rate is very low. Users report 50 gallons or less of new oil need be added to system each season.

ELIMINATES WATER AND WEATHER PROBLEMS — "Peak-Temp" eliminates need for water tanks, water pipes, etc. Requires no special foundation. Heavy-duty base, plus self-contained readiness for fuel, electric hookup, simplifies installation. Heat transfer oil has pour point of approx. 5°F, and will not freeze under normal early spring and late fall operations.

"Peak-Temp" can make your bituminous materials handling a top efficiency operation — even on toughest heavy-duty jobs. Write direct for full information — ask for bulletin AD-108.

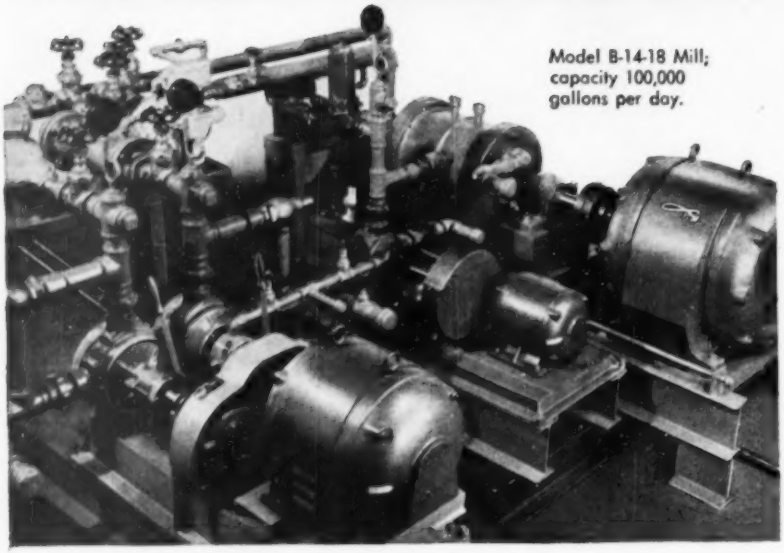
CLEAVER BROOKS COMPANY

Dept. A, 894 E. Keefe Avenue, Milwaukee 12, Wisconsin

Quick Facts on "PEAK-TEMP"

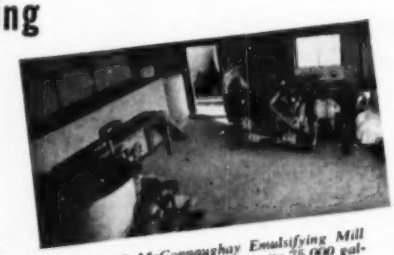
- **FULLY AUTOMATIC.** Operates on the principal of a closed heating system. Quick starts. Quick shutdown.
- **OIL and/or GAS FIRED** — low-pressure, atomizing-type burner.
- **SAFETY CONTROLS** — protect circulating system against low oil level.
- **MAXIMUM HEAT TRANSFER**—Exclusive "Peak-Temp" feature: Colder oil returned from circulating system is baffled to maintain best heat transfer efficiency.
- **SELF-CONTAINED** — includes pump, valves, piping, temperature and low-level controls, electric motors and controls.
- **AVAILABLE IN TWO SIZES** of stationary, electric-driven units: Series 1200—and Series 1800.

Your Best Sources of Emulsified Asphalt—
To Meet Specifications of Any Paving Job



Model B-14-18 Mill; capacity 100,000 gallons per day.

Each Licensee Is Equipped With Advanced *McConnaughay* Emulsifying Mill of This Type



Model B-18 McConnaughay Emulsifying Mill . . . permanent installation. Capacity 75,000 gallons per day.

Portable plant with Model B-14-18 Mill. Capacity 100,000 gallons per day.

Look for the nearest McConnaughay Licensee and you'll find the best source of Emulsified Asphalt to meet the specifications of any paving job. Here's why:

Each licensee has a McConnaughay Emulsifying Mill of the type illustrated above, *permanent* or *portable*, built to individual requirements for capacities up to 100,000 gallons per day. All mills make emulsions of the same high quality. All have outstanding records for dependability, extending over twenty years of successful operation.

In addition to manufacturing the mills and emulsifying agents, the McConnaughay organization supervises the production of all its Licensees; also does active research in its Lafayette laboratory as well as on the job, complementing the extensive service offered by the Licensees.

When you are figuring on any road, street or general paving job, and looking for the best source of Emulsified Asphalt, get in touch with your nearest McConnaughay Licensee or contact . . .

McCONNAUGHAY LICENSEES Operating K. E. McConnaughay Emulsified Asphalt Plants

Pan-Am Southern Corporation
New Orleans, *Louisiana*
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Doherty and Swearingen Co.
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Albany Asphalt & Aggregates Co.
Albany, *New York*

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Knight Paving Products, Inc.
Ithaca, *New York*

Knight Paving Products, Inc.
Rochester, *New York*

Ronald Kenyon Construction Co.
West Des Moines, *Iowa*

C. C. Plumb, Elmwood Station
Providence 7, *Rhode Island*

Seaco, Incorporated
Columbia, *South Carolina*

C. C. Plumb
Hartford, *Connecticut*

Asphalt Products Co., Inc.
Nashville, *Tennessee*

E. A. Mariani—Emulsified Asphalt
Tampa, *Florida*

Emulsions, Inc.
Lawrenceville, *Illinois*

Walsh & Ikeler
Gary, *Indiana*

Ready-Mix Asphalt, Inc.
Fort Wayne, *Indiana*

Fauber Construction Co.
Lafayette, *Indiana*

Brookman Construction Co.
Muncie, *Indiana*

Bituminous Materials Co.
Terre Haute, *Indiana*

Wabash Valley Asphalt Co.
Terre Haute, *Indiana*

Asphalt Materials and Construction, Inc.
Indianapolis, *Indiana*

Eastern Representative:

John A. Dow
157 Church St.
New Haven 10, *Connecticut*

SPECIFICATIONS OF THESE COLD-MIX PROCESSES AVAILABLE ON REQUEST

1—Penetration Macadam, 2—Open-Graded Plant Mix, 3—Open-Graded Road Mix, 4—Dense-Graded Plant Mix, 5—Dense-Graded Road Mix, 6—Mat Coat, 7—Seal Coat, 8—Sand Mix, 9—Sand Honing, 10—Patching.

K. E. McCONNAUGHAY
EMULSIFIED ASPHALT
Plants and Processes
LAFAYETTE, INDIANA

1 Two Caterpillar dozers working in two converging slots up through pit, pushing to stockpile next to crusher →

2 Crushing and screening plant eliminates oversize and produces specification material. Universal plant ↓

Pit Material Blended with Dozers

Plant of Barton Construction Co. example of resourceful methods used to meet Minnesota's gradation requirements for bituminous mix aggregates

HOW one contractor produced well-graded aggregates for a bituminous plant-mix job, using dozers as the principle means of securing uniformity from pit-run material, is here pictured and discussed. Also summarized are the specifications and procedures adopted by the Minnesota Department of Highways for its large-scale program of bituminous work involving single-aggregate plant-mix.

The plant, shown in the accompanying pictures and plan sketch, was that of Barton Construction Company, Minneapolis, Minn., located during the past summer near Annandale, Minn. The plant supplied 40,000 tons of aggregates and 36,000 tons of single-aggregate asphaltic mix for a resurfacing project on State Route 55.

The contractor availed himself of a state-owned pit located near the project, this pit being designated as a material source. As with most glacial deposits in Minnesota, this deposit consisted of sand and gravel laid down in definite strata and highly variable in gradation throughout the pit. It required careful blending before introduction into the crushing and screening plant, or else rather heavy wastage and frequent adjustment of the plant.

Doze Through Strata

Following the addage that it is best to solve your uniformity problems as fully as possible ahead of the crushing and drying, the contractor studied various schemes for delivering a blend of pit material to the plant. This objective was accomplished successfully by using heavy bulldozers to cut through a maximum pit depth in their delivery path. The dozer cut began at the pit bottom and passed through all pit levels as the material was moved upward into a stockpile, the material then feeding by gravity into the receiving hopper of the crushing plant.

The dozer operators initially took advantage of the natural hill of material by digging in at the toe on the far side and dozing upward through several horizons and across to the crusher. As the work progressed, the dozers each worked deeper and deeper, traveling along an independent trench in an adjoining quadrant to further aid in blending. At the time the accompanying photos were taken the two dozers had dug deep pockets, one working upward through about 12 ft. of strata and the other through about 20 ft. The effect of large depths

3 Crushed material drops to ground and is pushed by a third dozer, with U-apron, to top of stockpile next to asphalt plant

★ Details of crushing plant and delivery. International power units

and of the large stockpile running into several hundred tons was to deliver a very uniform material to the crusher, which in turn required infrequent adjustments to perform the necessary scalping and partial crushing.

The crusher output was spilled on the ground, where a third dozer performed a further blending operation. This unit, equipped with a U-shaped apron, pushed the crushed material up a long incline to the top of a stockpile containing about 2,000 tons of material. This material fed by gravity to the elevating conveyor of the asphalt plant located alongside. The dozing operation served to further blend the material, as likewise did the slide down into the reciprocating feeder. The final result was an economically produced aggregate that met the gradation requirements for the job.

(Minnesota state specification 3139, BA-2)

¾"	100% Passing
⅝"	95-100 Passing
⅜"	65-95 Passing
#10	35-65 Passing
#40	10-35 Passing
#200	1-7 Passing

This gradation is specified usually for Plant Mixed Bituminous Surface (single aggregate type), specification 2331 in Minnesota.

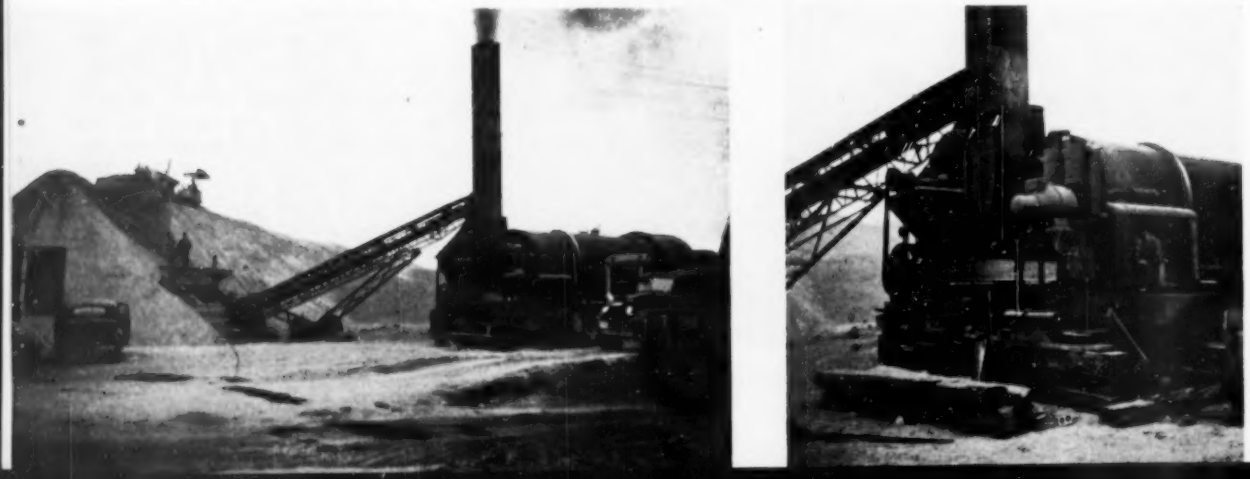
In operating this pit the contractor and the inspector cooperated to secure various adjustments which were needed to keep the product within specification limits. When necessary the first and second dozer slots were varied to take in more coarse or more fine material.

The plant equipment consisted of the following units designed for 225 tons per hour of aggregate and 160 tons per hour asphaltic mix production.

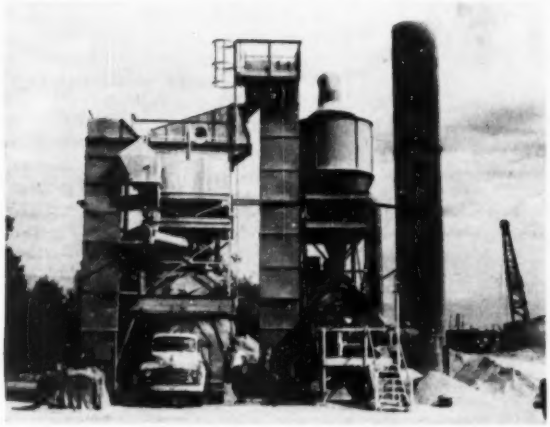
Aggregate Production

Plant consisted of three Caterpillar D8 tractors with dozers (two with U-dozer aprons), a Universal Model 880

4 Material thus thoroughly intermixed falls into feeder for delivery to asphalt plant. At right—A close-up of General Motors diesel-operated burner, stack blower, cold belt, and (via generator) the burner blower



Contractors Say, "Less Down-Time... More Profitable Production with Sturdy, Efficient CUMMER ASPHALT PLANTS"



Famous Cummer Plants Declared Important Factor in Success of Nation-Wide Highway Construction Program

Wherever new highways are stretching out across the land... wherever existing roads and streets are being brought up-to-date, you'll find Cummer Asphalt Plants doing a great job and getting the job done.

Over the years (and that means almost *sixty* years right now!), reliable, capable contractors have learned to rely on Cummer Asphalt Plants like the one shown here. This complete plant belongs to The City of Des Moines, Iowa, and is a Cummer Portable Asphalt Plant with a capacity of from 55 to 60 tons per hour (based on 5% initial water content, dried to within ½ of 1% and heated to 350°—400°F.).

The City of Des Moines has found this Cummer Portable a high producer and dependable profit-maker. Contractors everywhere praise Cummer Plants for requiring only the barest maintenance. Their ruggedness accounts for "less down time", helps keep operators "in the black."

An economical, efficient Cummer Asphalt Plant *belongs* in your operation.

Some of the Fine Features Incorporated in Cummer Asphalt Plants

Mixing towers with vibrating screens and mixer. Cold storage bin and feeder. Diesel or electric power.
Dust collector discharging reclaimed dust into hot elevator. Enclosed hot and cold elevators. Dust elevator for filler.
Two furnace combustion with low pressure burner equipment.

CUMMER PLANTS—complete with all motor and starter switches—are available in sizes from 55 to 125 tons per hour.
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1827 East 18th Street Pioneer Builders of Fine Asphalt Plants **Cleveland 14, Ohio**

Senior R crushing plant with power supplied by a U-24 International diesel unit, and a gasoline-powered feeder belt.

Asphalt Plant

Reciprocating feeder and belt; Pioneer heavy-duty dryer with electric drive on burner blower; General Motors diesel power unit, supplying belt power to the burner stack blower and the cold belt and electricity to the burner blower; hot elevator, bucket type; Barber-Greene Model 848 asphalt plant, powered by a Caterpillar D8800 diesel unit.

Asphalt was shipped to the job site in tank cars. The material was heated by steam supplemented by a retort booster and delivered to the plant in two 1300-gal. relay tank trucks at a temperature of 275° F. A 750-gal. reserve tank for asphalt was part of the plant assembly. Mix was delivered with a fleet of Chevrolet dump trucks.

Heads bituminous contractor group

The naming of Sheldon Beanblossom of St. Paul, as executive vice-president in charge of public relations for the Minnesota Bituminous Pavement Association, is announced by Charles Herbison, of Brainerd, president of that group of Minnesota contractors engaged in the construction of asphalt roads. New state offices for the association have been opened at 3410 University Ave. S. E., Minneapolis, Minn.

Scholl Elected Director Allis. Willis G. Scholl, vice president in charge of the tractor division for Allis-Chalmers Manufacturing Co., Milwaukee, Wis., has been elected to the firm's board of directors. Mr. Scholl was named to his present position in July, 1952. Previously, he had served as vice president and general sales manager, tractor division.

★ Recent model Chevrolet dump trucks, well cared for, were part of this contractor's fleet

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Jennite J-16 being applied to City Bus Stop Areas to protect asphalt pavement from oil and gasoline dripage, water seepage and frost action.

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Bituminous fellowship announced

The School of Civil Engineering of Cornell University has established a two-year fellowship for graduate study in the use of bituminous materials and aggregates for bituminous paving mixtures. This fellowship has been made possible by the generosity of the New York State Bituminous Concrete Producers Association.

The announcement noted that opportunities for study and research in the bituminous paving field at Cornell are enhanced by the availability of a small but well-equipped bituminous laboratory and excellent library facilities.

Applicants for the Spring term 1954 are now being considered. Information about the fellowship may be obtained from Professor Taylor D. Lewis, Lincoln Hall, Cornell University.

Fabric-in-paving film being scheduled

A colored motion picture of the new paving technique, bituminous resurfacing over welded wire fabric, was one of the principal sideshow attractions at the recent AASHO meeting in Pittsburgh. Several hundred of the state delegates saw the ten-minute film which portrayed the recent resurfacing of a portion of U. S. 61 in Minnesota.

The film, shown by the Wire Reinforcement Institute, Washington, will be shown throughout the country for highway officials, engineers, and contractors by member companies of the Wire Reinforcement Institute. Those interested in seeing this film may write Wire Reinforcement Institute,, Inc., National Press Building, Washington 4, D. C., for a list of member companies and a film-showing schedule. Information about other applications of welded wire fabric in bituminous resurfacing is also available.

Largest state road budget?

What is believed to be the largest state highway budget ever adopted for free road system development, has been authorized by the California Highway Commission. For the fiscal year starting July 1, 1954, the figure is $205,110,000 for major construction.

This sum is budgeted for 585 miles of highway improvements including many miles of urban freeways, expressways between larger cities and also various rural sections. Right-of-way will take nearly $60 million of this sum. The gross budget for all highway purposes including administration, maintenance and engineering is $267,241,290, an increase of 8% over the previous year.

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THE SIMPLICITY VERTICAL TANK (with "Hot Well") keeps only enough asphalt heated to required temperature to supply the plant. The "inner well" is insulated by the larger quantity of asphalt at lower temperature in the "outer tank." This saves much in steam cost. Portable tanks from 20,000 to 100,000 gallon capacity.

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Asphalt Technologists Announce Varied Program

THE annual meeting of the Association of Asphalt Paving Technologists will be held February 1-3, 1954, at the Kentucky Hotel, Louisville, Kentucky. The schedule of the meetings as announced by Ward K. Parr, secretary-treasurer, is as follows:

Monday, February 1
10:00 a.m., Annual Business Meeting
2:00 p.m., First Technical Session

Tuesday, February 2
9:00 a.m., Second Technical Session
2:00 p.m., Third Technical Session
7:00 p.m., 30th Anniversary Banquet

Wednesday, February 3
9:00 a.m., Fourth Technical Session
2:00 p.m., Fifth Technical Session

The 30th anniversary banquet will honor charter members of the Association. Dean Walter J. Emmons of the College of Engineering, University of Michigan, a former secretary-treasurer of the Association, will be toastmaster and Mr. Bernard E. Gray, president of The Asphalt Institute, will be the feature speaker.

Details of Papers

A brief abstract of the papers offered and accepted by the Board of Directors for presentation at the meeting is given as follows:

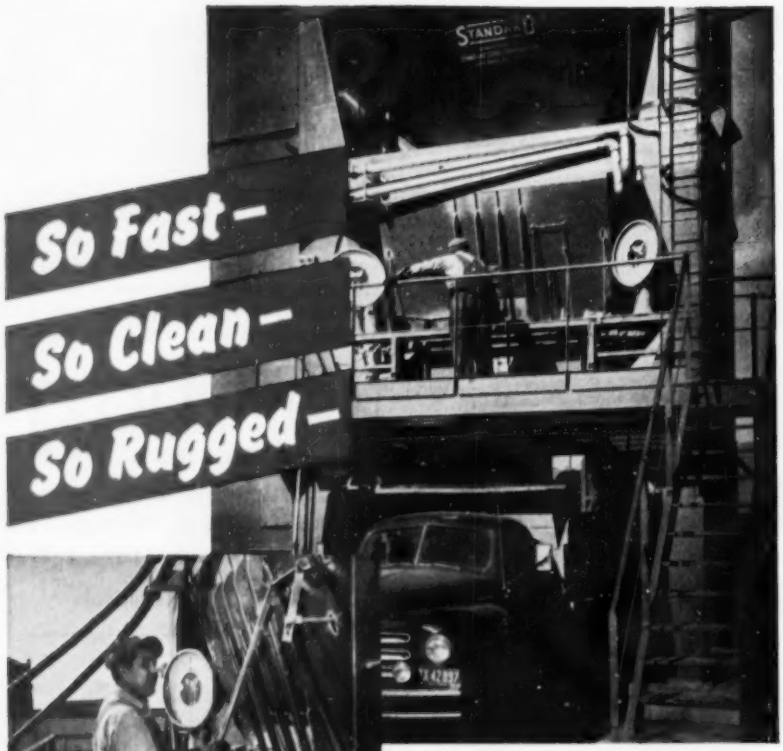
1. Symposium on "Plant and Pavement Inspection of Asphaltic Surface Construction"—Chairman, J. Rogers Martin; Panel Members, Moray F. Macnaughton, A. T. Dengler, E. O. Sellers, L. C. Reime, and one other panel member yet to be selected.

The subject of this symposium will cover training and qualifications of inspection personnel, control of plant operation including inspection of materials, weighing batch and temperature control. The pavement portion of the symposium will deal with yield, spreading and rolling operations and control of traffic.

2. "A Rapid Means of Determining the Constituents of Asphalts"—by

Round table at Barber-Greene Bituminous Conference *(See photo)*

★ Round table discussion of "question box" topics in progress at Barber-Greene Bituminous Conference. In attendance at the Dec. 9-11 conference (first of two) were J. F. Atkinson, C. B. Genther, L. C. Hooper, Pace Associates, Chicago; J. R. Banning, The Asphalt Institute, Denver; George B. Finley, The Asphalt Institute, Austin, Tex.; E. M. Howard, The Asphalt Institute, Springfield, Ill.; Herbert Spencer, The Asphalt Institute, New York; Waldo G. Bowman, R. H. Dodds, Engineering News-Record, New York; J. Roland Carr, Engineering News-Record, Chicago; Harold J. McKeever, Gillette Publishing Co., Chicago; C. C. Burton, R. L. Rodgers, Standard Oil Company (Indiana), Chicago; Vern J. Damkroger, Paul E. Sonderegger, Western Laboratories, Inc., Lincoln, Nebr.; G. L. Farnsworth, Husky Oil Co., Cody, Wyo.; Harry K. Fisher, Natural Rubber Bureau, Washington, D. C.; Merrill L. Garden, Garden Engineering Service, Inc., Oskaloosa, Ia.; Charles W. Graves, Socony-Vacuum Oil Co., St. Paul; J. Leonard Stone, Socony-Vacuum Oil Co., Casper, Wyo.; G. Truman Lee, Shell Oil Co., New York; H. T. Perez, H. W. Richardson, Construction Methods and Equipment, New York; D. R. Sayers, Parsons, Brinckerhoff, Hall & MacDonald, New York; Jack C. Steinsberger, Chas. W. Tarman, DeLeuw, Cather and Co., Chicago; Frank L. White, Polymer Corporation, Ltd., Sarnia, Canada; John D. Wilkie, The Ohio Oil Co., Lovell, Wyo.; Samual L. Zimmerman, Pioneer Asphalt Div. of Witco Chemical Co., Chicago.



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Professor L. H. Csanyi, Iowa State College.

The method described will deal with a rapid solution procedure for determining the resin and petrolene content of asphalts and will refer to the use of ultraviolet light for identification of these constituents.

3. "Investigations of Rubber Additives in Asphalt Paving Mixtures"—by L. E. Gregg, Kentucky Department of Highways, and W. H. Alcoke, University of Kentucky.

The results of research with various types and forms of rubber as additives in hot asphalt paving mixtures and of several tests for significant properties of these mixtures will be presented. Emphasis is placed on fundamental relations involved and techniques for evaluation rather than on comparison of results applicable to various rubber additives. Correlations between laboratory and field conditions are provided by samples from a test pavement project.

4. "Measurement of Maximum Theoretical Densities of Bituminous Mixtures by Solvent Immersion"—by Paul J. Serafin, Michigan State Highway Department.

A method will be described for the direct measurement of maximum theoretical density of bituminous mixtures from which the void content can be calculated. The method will be described together with comparative test results, both on laboratory mixes and field samples, with comparison with present methods of determination.

5. "An Approach to Flexible Pavement Design" — by Dr. Norman W. McLeod, Canadian Department of Transport.

An approach to flexible pavement design based on the concept of ultimate strength is the subject of this paper. The theory behind this presentation is based on the fact that flexible pavements do not behave as perfectly elastic materials but are more likely to perform as plastic materials. Consequently, the flexible pavement design problem may be treated on the basis of ultimate strength which in effect involves the plastic approach.

6. "Paving Road to the Summit of Mount Equinox—Applying a Graphical Method of Multiple Blending of Aggregates"—by Charles F. Parker, W. H. Hinman, Inc.

In connection with this paving project, this paper will discuss the processing of the aggregate and the principles of secondary screening to produce a uniform and high quality material, together with blending methods which were applied successfully in the mix formula control. Marshall design methods used furnished much fundamental information concerning procedures and type of mixes.

Idaho Test Road

7. "WASHO Test Road"—by William N. Carey, Jr., Highway Research Board.

This paper will describe construction and test results obtained on the WASHO Test Road. The topic will outline a number of important observations made during the testing last fall and this year with their possible correlation with the pavement design.

8. "Rheological Properties of Asphalt"—by Edmund Thelen, Franklin Institute, National Asphalt Research Center.

The fundamental properties of asphalt are being studied to define its behavior in service. The results of three years of research with respect to several concepts of rheological behavior of asphalt will be presented dealing with the viscoelastic properties of asphalt.

9. "Progress Report on Test Sections of Bituminous Concrete Overlay on Rigid Pavement in North Carolina"—by A. Duke Morgan, North Carolina State Highway and Public Works Commission.

The construction, experience and results will be described on a test road of fourteen 1,000 ft. sections comprised of various bituminous concrete and surface treatment overlay surfaces constructed. Three types of aggregate were contained in the various mixtures; namely, crushed granite, 50% crushed gravel and uncrushed gravel.

10. "Bituminous Concrete Density Study"—by Frank Williams, Ohio Department of Highways.

As a continuation of a previous paper, further data will be presented relative to the effect of mixture coarseness on density, variation in mix temperature on density and thickness of pavement on density. The data will represent both measurements made at time of construction and after 1 to 2 years of service.

11. "New Technique of Laboratory Compaction of Bituminous Mixtures"—this will be a combined presentation by H. J. Nevitt, Consulting Engineer, and H. M. Calderon of the Mexico Department of Highways. Mr. Nevitt will discuss the theoretical aspects that are required in duplication of field and laboratory compaction, and Mr. Calderon will describe laboratory technique for producing a duplication of the theoretical effects in the proposed laboratory method together with preliminary test results.

12. "A Comparative Study of Straight Run, Thermal and Blown Asphalts"—by L. W. Corbett, Miller-Warden Associates.

The basis of comparison in this paper is the percentage of pentane insolubles and the physical characteristics of the asphalts' petrolene fraction. The study includes six straight run asphalts, two thermal asphalts and a blown asphalt from each, and specific gravity, viscosity, refractive index, viscosity gravity constant, and specific gravity refraction results will il-

(Continued on page 96)

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Applying bitumen through 2 feet of spraybar as shown may not appear unusual or different, but when the operator can use any length—from 1 to 24 feet—*without changing the pressure* and *without any application adjustment whatever* . . . then there's a difference. It's *Rosco's Pressure Metering Method* that makes that difference.

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It is this Pressure Metering Master Valve, the "heart" of Rosco Distributors, that gives you this built-in control of pressure which is the only accurate method of obtaining precise bituminous application. This is the valve that also directs the flow of material for all of the Rosco Distributor functions.

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VIEWS AND COMMENTS

By H. G. Nevitt

Spray Bars

It is obvious that in a sealcoat, and occasionally in some other type of construction, a completely uniform distribution of the bituminous material is essential to good results. To anyone driving extensively over the United States it will be apparent that this situation is not always recognized or at least not always provided. Its cure covers almost all phases of bituminous procedure.

The designer or specification writer must make sure that grounds for the situation are not laid in the job description. Not merely must the project engineer be given proper authority to permit only satisfactory equipment for doing the work, but he must likewise be assured suitable materials and application temperatures. The bitumen as applied must spread or "flatten," not run; it can neither be too viscous or too thin at the application temperature. Furthermore this cannot be too high regardless of theoretical viscosity at that temperature, because instant chilling on striking the road surface may change the conditions; and excessive heat in the case of the naphtha cutbacks is liable to drive off some of the solvent present so that the material actually is spread at a higher viscosity than calculated and therefore fails to function properly. What is really needed is a study of this situation, with the determination of the correct surface viscosity to give the proper flattening, and specifications which then establish this viscosity rather than set arbitrary temperatures regardless of the material supplied to the work.

• The construction procedure must, of course, likewise be satisfactory and be controlled by the inspector. The irregularity of distribution possible with good equipment under poor handling is much greater than is generally realized. California some years ago made some tests on this point; the results were astounding. Great and continuing care on the part of the contractor to keep his equipment in good condition and to operate it satisfactorily is essential. Obviously the inspector must make sure that those contractors who are not aware of this, or who are not sufficiently concerned to get the best possible results, do so regardless.

Finally, the matter of better manufacturing is involved. Distribution of liquids through orifices is a very involved technical matter, as anyone who has worked on the subject can testify whether it be on nozzles for jet or diesel engines, those for spray drying, or those for uniform liquid distribution, such as in the paint industry and in bitumen distributors. Nevertheless, by careful investigation and study, definite improvement is possible in the construction of such nozzles. Likewise we need maximum effectiveness from the standpoint of being able to keep the nozzle and spray bar system clean and functioning despite the hazards existing in road work. We wonder if the manufacturers of distributors have done everything possible here. Some of the outstanding ingenuity which has been evident by equipment makers, and for which the highway engineer owes a great debt, might be wisely exhibited in further improvements on the nozzle and spray bar system to more positively assure that uniform distribution results from the equipment as built, and that it can be kept in this shape without much trouble or maintenance by the user.

It might be wise to conclude this discussion by the statement that the great majority of troubles presently observed arise in the actual construction of the work rather than in the field of design, specifications or manufacture. Good highway construction is in most respects a matter of great and detailed care at every point in the work. That this is not being given to the extent possible is understandable under recent conditions, but this in the end will fail as an excuse for suffering poor construction, or poor inspection which permits it to get by.

It is interesting to note that improvement of distribution of bituminous material is typical of highway problems in that it involves a great number of people but is most of all at the mercy of the man doing the job and those supervising it.

Grant for bituminous research in Michigan

The Michigan Asphalt Paving Association has granted $2,500 to the Department of Civil Engineering of Michigan State College. The Great Lakes Asphalt and Petroleum Company, Chicago, Ill., has subscribed an additional $300, and other organizations are expected to contribute.

The money will be used to purchase additional laboratory equipment needed to replace obsolete equipment, and to provide additional laboratory facilities required to put the bituminous laboratory in operating condition for the use of student engineers and graduate students in testing and research work on bituminous materials.

The new equipment to be furnished includes such items as a new Humbolt ductility machine, triaxial compression testing machine, Marshall stability machine, distilling apparatus, ovens, extractors and other standard laboratory equipment. The college plans eventually to develop one of the most modern and up-to-date laboratories devoted to bituminous studies available in any college.

The establishment of a new and modern bituminous laboratory will be part of the new Construction Engineering optional course being developed under the direction of Dr. J. R. Snell, head of the Department of Civil Engineering at Michigan State College, at East Lansing. The new program will include courses in the study of bituminous materials, standard tests, mix design and construction and maintenance methods. This will be a very forward step in training students on a subject on which there has been very little instruction offered in the engineering colleges up to the present time and will be in keeping with the rapidly expanding use of asphalt in all types of modern highway construction.

Professor W. I. Kenerson has been placed in charge of the new Construction Engineering Course and will personally supervise the bituminous part of the program.

• **J. Robert Bazley,** of J. Robert Bazley, Inc., Pottsville, Pa., has been nominated as president of the Associated Pennsylvania Constructors of 1954.

Why Sellin Bros. are sold on **CAT*** performance

Harold and Roy Sellin, Hawley, Minn., are strong for the D8 Tractor and No. 80 Scraper. They say: "For success in earthmoving, buy Caterpillar!"

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Here's what Harold and Roy Sellin say about their machines: "Caterpillar equipment is the best made, and durability is the outstanding feature. The No. 80 Scrapers load much faster and easier than other makes of machines, and production is higher."

When you're buying a scraper, look at your *last* cost *first*. Compare the Cat No. 80 or the new No. 90 with any other make on cost per yard. Then figure the cost of repairs and down time. You'll find Caterpillar Scrapers not only *outperform* but *outlast* other makes, in every kind of going.

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Asphalt technologists

(Continued from page 93)

lustrate differences in the petrolene fraction. These tests provide a concept to explain some of the fundamental differences.

13. "The Deformation Mechanism and Bearing Strength of Bituminous Pavements"—by Charles Mack, Imperial Oil Limited.

The hardening and increase in strength of bituminous pavements under load is demonstrated by experimental results. Data are given for the bearing strength as a function of asphalt content, temperature and composition.

14. "Statistical Quality Control"—by F. B. Odasz and Don Nafus, Husky Oil Company.

The application of this tool of inspection on an actual construction project will be described.

Asphalt Institute elects Harsch and Gray

At their annual meeting held recently in New York City, the Board of Directors of the Asphalt Institute, representing the major part of the petroleum asphalt production industry of the United States and Canada, elected Raymond Harsch, Manager of the Asphalt Department of Shell Oil Company, San Francisco, Chairman

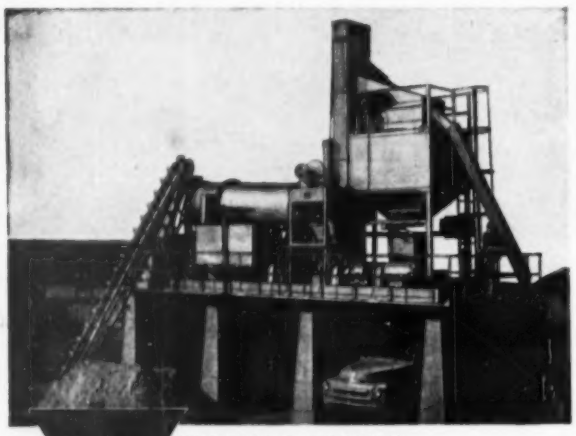
Raymond Harsch

of the Executive Committee, for the coming year, and re-elected Bernard E. Gray, President.

Vice Presidents elected for the five U. S. geographical divisions of the Institute were the following: George R. Christie, Socony-Vacuum Oil Company, Inc., for Atlantic Coast Division; Lysle Walker, Leonard Refineries, Inc., for Ohio-Great Lakes Division; Chester Eberle, Macmillan Petroleum Corporation (Arkansas) for Mid-West Division; James J. Kelly, Kerr-McGee Oil Industries, Inc., for Southwest Division; W. F. Lyte, Douglas Oil Company of California for Pacific Coast Division. These Vice Presidents, together with Messrs. Harsch and Gray, and D. N. Myers of Byerlyte Corporation, ex-officio as retiring Chairman, constitute the Executive Committee for the coming year.

Herbert Spencer was re-elected Secretary of the Institute, George R. Christie, Socony-Vacuum Oil Company, Inc., was re-elected Treasurer and John N. Smith, also of Socony-Vacuum Oil Company, Inc., Assistant Treasurer.

• **Louis J. Drasler,** formerly division engineer, Ohio department of highways, has been appointed service director, City of Cleveland.



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These reasonably-priced stationary hot plants are complete on one steel frame, for easy moving to a new location. Excellent for medium-size city paving jobs; for street and highway maintenance, and for paving driveways, alleys, sidewalks or industrial plant areas.

Oil-fired rotary dryer, batch mixer, vibrating screen, divided hot bin, dust collector, volumetric or weigh scales, engine or electric power, air controls.

Model L-12, 12-15 tons per hour; Model L-25, 25-30 tons per hour. Portable units also available

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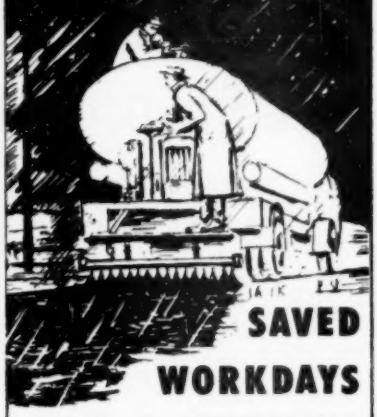

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During construction of the N. J. Turnpike, penetration courses were shot with **NOSTRIP**-treated asphalt under moisture conditions which normally would have halted the job.

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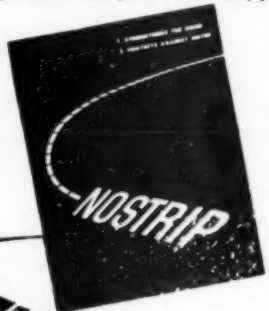

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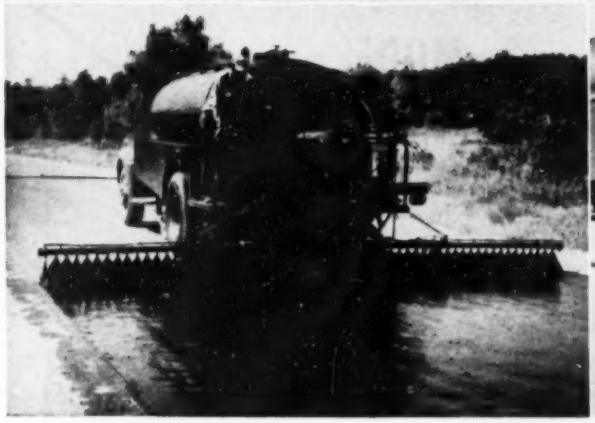
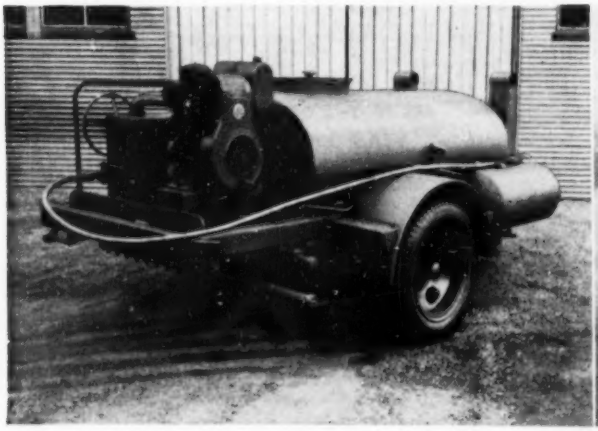


Accurate distribution, dependable performance, economical operation are features built into every Etnyre "Black-Topper." Note that straight-line edge, that complete triple-lap coverage in photograph above.

Use your "Black-Topper" to pump bituminous material through Etnyre's new Underseal Gun to stabilize concrete pavement subgrade. Get details and prices —ask about Gun No. US-1A.



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Handspraying can be handled simply and efficiently. Each "Black-Topper" comes equipped with convenient handspray controls, 25' flexible steel asphalt hose, and cold handle handspray gun.

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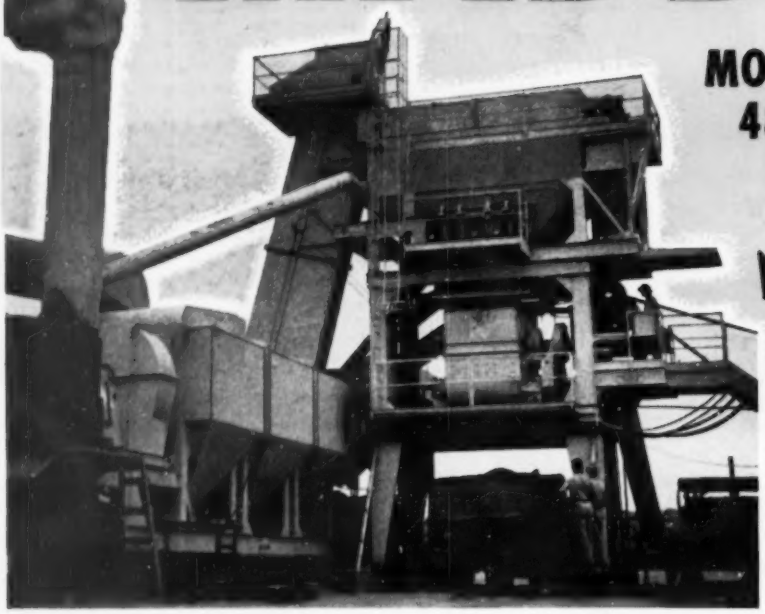
MODEL 481



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Now is the time to learn about MADSEN! Let us tell you the complete story about the new MADSEN 481 4000-lb. Batch Capacity Asphalt Plant.

Let's Clean-up America's Highways
America's highways are beautiful. Don't make them a dumping ground for cans, bottles and rubbish.
MADSEN ASPHALT PLANTS

Photo at top of page shows the MADSEN Model 481 4000-lb. Batch Type Asphalt Plant in full operation. It is equipped with combination direct diesel drive and diesel electric drive, utilizing a Caterpillar 156 KW generating unit. Complete set-up includes a MADSEN 380 Dust Collector unit and a MADSEN 84" x 30' Dryer.

HERE ARE SOME FEATURES THAT MAKE THE MADSEN MODEL 481 YOUR BIG MONEY-MAKING POTENTIAL IN ASPHALT PLANTS

- **New MADSEN Model 440 Twin-Shaft Pug Mill Mixer (Patent Pending) with improved mixing action, faster discharge, built-in oversize capacity and precision-ground, externally removable sectional liners.**
- **Exclusive bin design (Patent Pending) for more uniform withdrawal of aggregates.**
- **MADSEN Pressure Injection System (Patent No. 1987243) . . . the asphalt is pumped into the mill in 5 to 7 seconds!**
- **Mixer operator station on end of plant away from fumes and heat.**

WRITE for your copy of Bulletin No. 800 describing the MADSEN Model 481

MADSEN IRON WORKS, INC.

14100 E. ROSECRANS AVENUE, P. O. BOX 38 LA MIRADA, CALIFORNIA

MADSEN Equipment that Serves ®

O'HADI ROAD & STREET PATCHER

An all weather Patcher.
Fast, economical, permanent

Simply place it over the cleaned hole. Fill the hopper with mix.

The O'HADI PATCHER heats the hole and the mix at the same time.
Satisfaction guaranteed. Sold on 30 days trial.
No Road or Street Department can afford to be without O'HADI PATCHERS.

BUHL MACHINE Wks. Buhl, Idaho

GARRISON
HYDRAULIC POWER STEERING
Now available for Caterpillar's new No. 112 and No. 12 Motor Graders!

GARRISON POWER STEERING takes the work out of steering heavy graders and off-the-road equipment. Wheel fight is eliminated; road jolt is absorbed by the power cylinder, resulting in less driver fatigue. Mechanical steering is in effect at all times for greater safety.

Kits are available for most makes of graders, wheel-type tractors, trucks and truck cranes, for easy installation in the field.

Also Available for 75 H.P. #12 Graders!

Contact your equipment dealer or write direct.

GARRISON Manufacturing Co.

1500 SANTA FE AVENUE LOS ANGELES 21, CALIF.

Alloy paddle tips survive big tonnage

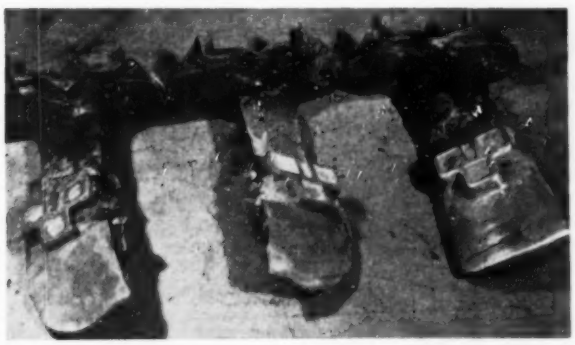
An experimental service test of paddle tips of the new Thermalloy HC-250 metal was made recently at the asphalt plant of Ward Pavements, Inc., Haverstraw, N. Y. This plant, an old (1931) Cummer, was chosen because of its large production under typical service conditions. The paddle tips, manufactured by American Brake Shoe Co., supplanted the very durable Cumzite tips, which are themselves more abrasion resistant than manganese tips and had been specified and furnished by F. D. Cummer & Sons for their plant installations in recent years. Cummer now supplies the new HC-250 tips.

Figure 1 shows tips of both old and new types after test. The Cumzite tips (middle and left) are badly worn after 18,000 tons of plant production, heretofore not a bad performance. The HC-250 tipped paddle (right) is in "new" condition after 42-000 tons. Figure 2 shows a new HC-250 mixer tip (left) and one (right) that has survived 81,700 tons of production with only the beginning of wear.

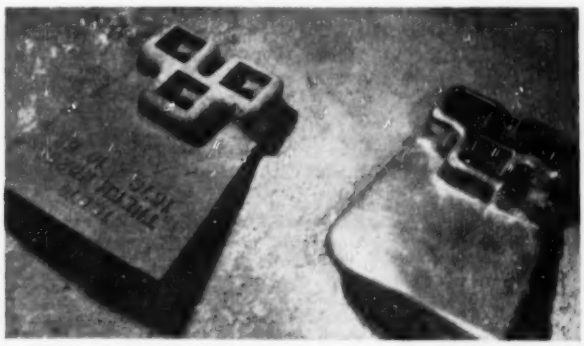
Record Oregon road budget for 1954

The Oregon State Highway budget for 1954 will be $41,400,000 for construction expenditure, or $11 million higher than 1953. The total highway expenditures including construction are budgeted at $72,896,000 compared with $62,015,000 in 1953.

Galion Allsteel Body Acquires Austin Loaders. Galion Allsteel Body Co., Galion, O., has acquired sales and manufacturing rights of the complete line of Austin overshot tractor loaders patented and manufactured by John Austin Mfg. Co., Denver, Colo.

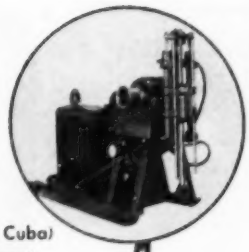


★ Figure 1—Showing both old and new type paddle tips, the old type being the one at the left (see text)



★ Figure 2—A new Thermalloy HC-250 paddle, and one showing little wear after 81,700 tons of asphalt mix production

4 ACKER TEREDOS' drill 'round the clock for 3 months



In building the new Almendares Vehicular Tunnel between Vedado and Miramar (two popular communities in Havana, Cuba) four Acker Hydraulic Feed Core drills were used for drilling grout holes. Working around the clock for almost three months, the four Ackers showed little sign of wear.

Rugged construction, simplicity of operation and the many exclusive features that Acker designed and developed during the past 30 years.

Write for prices and Bulletin 30, RS.

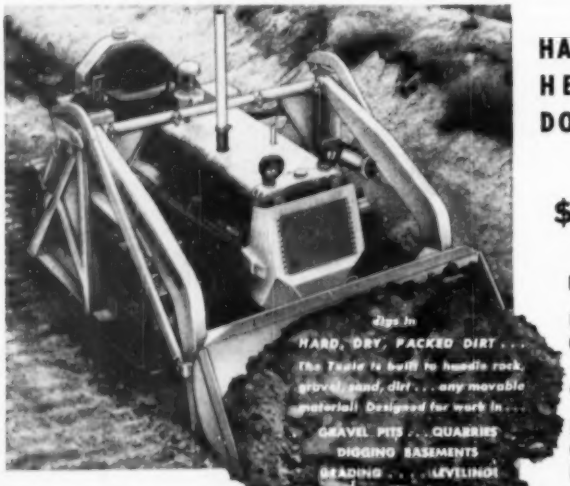
ACKER DRILL CO., Inc.

725 W. Lackawanna Avenue Scranton, Penna.

Manufacturers of a complete line of Diamond and Shot Core Drills, Drilling Accessories and Equipment

Small Investment buys **BIG LOADER** performance!

For CLEATED or SMOOTH SHOE . . LONG or SHORT TRACK CRAWLERS


digs in
HARD, DRY, PACKED DIRT . . .
The Teale is built to handle rock, gravel, sand, dirt . . . any movable material. Designed for work in . . .
GRAVEL PITS . . . QUARRIES
DIGGING BASEMENTS
GRADING . . . LEVELING!

A HARDWORKING HEAVY-DUTY DOZER-LOADER

for only **$1925** OR LESS

FULLY HYDRAULIC

Ideal for replacing OLD HYDRAULIC or CABLE LOADERS

PUT-ON . . . TAKEN OFF EASILY! For TD-6, TD-9, D-2 D-4, HD-5 and the Oliver A & B

UNUSUALLY STURDY LOADER

Built to take ANY punishment a crawler can give it. High quality Prince cylinders, chrome-plated shafts of "Stress-Proof" steel, and Hydreco heavy-duty detent valve and pump guarantee fast, smooth, trouble-free hydraulic operation. With a TEALE, a small investment DOES buy BIG-LOADER performance. Distributor territories available!

THE STANDARD FOR QUALITY IN THE DOZER-LOADER FIELD

For full information WRITE TODAY!

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AND COMPANY
P.O. Box 308, Omaha, Nebr.

N. J. turnpike traffic gains 24% in year

Traffic on the New Jersey Turnpike in the first nine months of 1953 increased 23.9 per cent compared with the same period in 1952. Toll and concession revenues were up 20.9 per cent.

Traffic totaled 16,525,300 revenue vehicles, a daily average of 60,500. The daily average is 2½ times the pre-construction estimate for 1953 and equals the 1975 forecasted flow.

Tolls and concession revenues were $16,146,353 for the nine months, compared to $13,354,642.

Commercial vehicles continued to register sharp increases, bus traffic increasing 68.3 per cent and trucks 57.3 per cent over 1952, trucks representing 9.5 per cent of total tolls.

The Turnpike's safety record improved. During the September quarter 15 more neon-lighted signs were erected on the northern end to inform motorists of slower speeds because of fog, snow, ice and other conditions. Twelve more police were added, with 77 now assigned to the 118 mile road.

The accident rate during the nine months was 62.1 (411 accidents) per 100 million miles of vehicular travel, down 31.9 per cent. The accident rate for all New Jersey public highays for all of 1952 was about 380 per 100 million miles or more than six times that on the Turnpike.

There were 21 fatal accidents on the Turnpike in this year's first nine months, causing death to 26 persons, a reduction of 10, or 28 per cent compared with the same nine months in 1952, they aver. Of this year's 21 fatal accidents, 12 were of the single car type and involved no other vehicles, and caused death to 16 of the 26 persons. Careful analysis shows the causes as (1) inattention to driving; (2) losing control and overturning, or striking guard rail, bridge abutments or other fixed objects; (3) walking persons hit by vehicles and, (4) falling from vehicles.

Using the standard basis of comparison of the national and state governments, and of the National Safety Council, the Turnpike's fatalities in this year's first nine months were equal to 3.93 per 100 million miles of travel. That rate (3.93) would compare with 4.1 (preliminary figure) on New Jersey's public highways in the first eight months of 1953. The Turnpike fatality rate ranked with three States and the District of Columbia which reported the lowest rates for vehicular fatalities in the country during 1952. For the nation's highways as a whole, the indicated fatality rate in this year's first nine months was 6.7 per 100 million miles of travel.

Esgate Elected Thew Vice President. E. S. Esgate has been elected a vice president of The Thew Shovel Co., Lorain, O.

With the Manufacturers and Distributors

New Bergen Director of Sales. Robert S. C. Ernst has been appointed director of sales and merchandising departments of Bergen Wire Rope Co., Lodi, N. J.

Caterpillar Promotions. Promotions in the domestic sales department of Caterpillar Tractor Co., Peoria, Ill., have been announced by W. S. Zeigler, manager of domestic sales. H. J. Hunkele, formerly assistant sales manager of the central sales division, has been transferred to the engine division where he has been named assistant manager of industrial sales. He is replaced by E. A. Tlarks, who for the past three years has been assistant sales manager in the Western sales division. C. B. Leber has been promoted from a district representative in the plains sales division to assistant sales manager in the plains division, replacing H. G. Eberling, who is being transferred to the Western sales division for a new assignment.

Leibsle Appointed Sales Manager. Robert Leibsle, associated with the Wood Manufacturing Co. since 1945, has been appointed sales manager of Pettibone Wood Mfg. Co., North Hollywood, Calif., Pettibone's recently acquired West Coast subsidiary, with headquarters at the Pettibone Wood Mfg. Co. factory and sales offices at 6900 Tujunga Ave., North Hollywood, Calif.

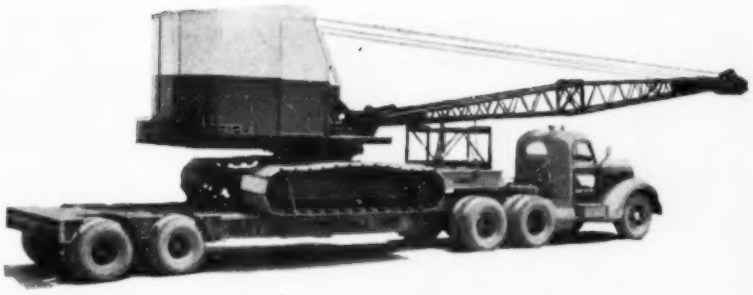
Worthington Promotions at Plainfield. According to an announcement by E. J. Schwanhausser, executive vice president, Worthington Corporation, Kenneth W. Horsman has been appointed general manager of the company's Plainfield, N. J., works, and will be responsible for engineering, manufacturing, and sales of the products manufactured at that location. Paul J. Foley has been appointed general sales manager for all Plainfield Works products. John F. Weissert has been appointed general superintendent of plant operations at Plainfield. W. J. Fleming, formerly associated with the sale of Plainfield built concrete machinery has been transferred to Worthington's Holyoke, Mass., Works where he will have charge of the sale and distribution of the company's line of portable air compressors and air tools.

Carroll Elected President American Hoist. John E. Carroll, former vice president of sales, has been elected president of the American Hoist and Derrick Co., St. Paul, Minn. He succeeds Harold O. Washburn, who was elected chairman of the board of directors.

Lenz Heads Euclid Service Department. Robert J. Lenz has been appointed manager of the Customer Service Department of The Euclid Road Machinery Co., Cleveland, O. He succeeds George M. Perry who has been named director and works manager of Euclid Great Britain, Ltd.

Alexander Appointed Sales Representative. L. J. Alexander has been appointed sales representative in Nassau and Suffolk Counties, New York, for the H. O. Penn Machinery Co. These counties are handled by the Mineola, Long Island branch of the company.

Wilson of Galion Retires. After 36 years of service with The Galion Iron Works & Mfg. Co., Galion, O., W. C. Wilson retired Jan. 1st. Mr. Wilson is 68 and has for many years been Galion's district representative in the states of Virginia, West Virginia, Tennessee, and Kentucky. He will continue his residence on Route No. 1, South Point, O.



YOU CAN DEPEND ON **TRANSPORT TRAILERS**

CARGO CARRIER MODEL GPX-F Especially designed for safe, secure hauling of heavy cantilever loads. Capacities 16 through 35 tons. Exclusive TRANSPORT tandem axle assembly gives full oscillation of each axle over rough roads . . . adds extra mileage to trailer tires . . . reduces road shock transfer to payload. TRANSPORT semi-trailers fit single or tandem axle truck tractors. Flat deck as shown or drop deck.

FOR ADDED SERVICE . . . Single or dual axle TRANSPORT front dollies convert to full trailers easily and quickly.

WRITE FOR COMPLETE INFORMATION

TRANSPORT TT TRAILERS INC
CEDAR RAPIDS IOWA, U.S.A.

Do your sealcoating and ice control jobs the fast easy Swenson way. Spreads salt, chloride, sand, rock chips, gravel or cinders any width or amount desired.

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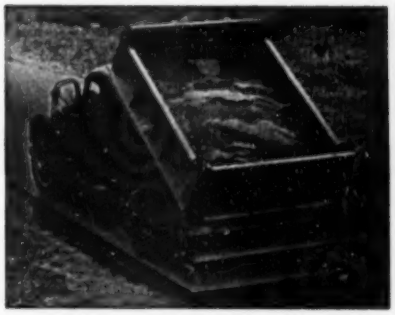
Lindenwood, Illinois



NOW! "TARPS" AT DEALER COST!

BURCH Weather-Tite TARPAULINS

Now for the first time you can get the QUALITY BURCH WEATHER-TITE TARPAULINS in all weights, at a new low price. You are invited to write in for our new price list. . . Simply submit your request on your letterhead and you will be eligible for our dealer price list. Compare the quality—Compare the workmanship—COMPARE THE PRICE and you will specify BURCH WEATHER-TITE!

BURCH MANUFACTURING COMPANY, INC.
FORT DODGE, IOWA DES MOINES, IOWA

Leek Appointed District Manager. Richard Leek of the Construction Machinery Division of Chain Belt Co., Milwaukee, Wis., has been appointed to the newly created position of Mid-Atlantic district manager. Leek, formerly Mid-Atlantic district representative joined the Chain Belt Organization in 1949 as a student engineer. He will remain at his present location, 4125 Whitaker Ave., Philadelphia, Pa.

Pohl Motor Grader Sales Manager for A-C. Promotion of Neil Pohl to the newly created position of motor grader sales manager, industrial sales department of the Tractor Division, Allis-Chalmers Manufacturing Company, Milwaukee, Wis., has been announced by A. E. Dorn, industrial sales manager. Pohl was industrial sales manager at the Kansas City branch of the Tractor Division since May, 1952.

NOW..a New principle in REWIND STARTERS

This amazing new Armstrong Starter is packed with important new features —
It is 50% lighter — smoother acting — easier to service and mount.
The principle is based on the use of friction inside a conventional rope starter cup. Actuated by a cam principle it engages after ¼ inch pull. Eliminates danger of teeth or pawls breaking — permits greater tolerances in mounting. Available with stationary or rotating screen. Competitively priced.

ARMSTRONG BULLDOG STARTER

HERE'S HOW IT WORKS

1. Cam actuated teeth extend to grip inside of standard rope pulley cup.

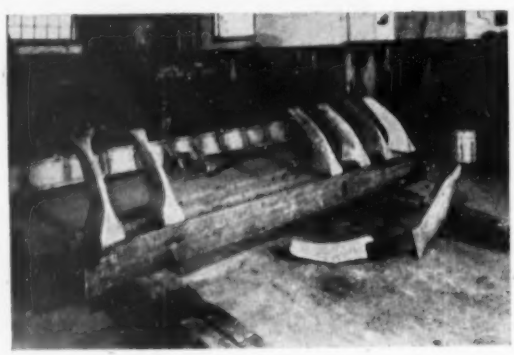
2. Spring loading retracts teeth when pull stops.

3. Rope pulley available for hand starting in case of emergency.

4. Heart of unit can be incorporated in end products design.

If you make, sell or use products like these, you can reduce weight — improve starting — increase starter life. Chain Saws • Pumps • Power Mowers • Outboard Motors

ARMSTRONG PRODUCTS CO • Milwaukee, Wis.



WE make RAKES— YOU make MONEY—

ROCKLAND Rake, Model RF-1, shown in process of assembly, when mounted on your tractor, will give you the most versatile land-clearing rake ever offered to the construction industry.

A complete line of land-clearing equipment for all tractors.

Write for full information and name of your dealer.

ROCKLAND ALLIED EQUIPMENT CORP.
Harborside Park, Providence 5, R. I. Williams 1-5400

Crawford New Hough Advertising Manager. Madison L. Crawford, for the past 6 years Associate Advertising Manager of industrial truck division of Clark Equipment Co., has been appointed advertising manager of The Frank G. Hough Co., Libertyville, Ill.

New Cleaver-Brooks Distributor. Hi-Way Equipment Co., 953 McCarty St., Houston, Tex., has been appointed distributor for 25 counties in southeastern Texas for the Road Machinery Division of Cleaver-Brooks Co., Milwaukee, Wis.

Dix Appointed Euclid District Manager. John C. Dix has been appointed district manager by Euclid Road Machinery Co., Cleveland, O., with headquarters in Atlanta, Ga. He will handle Euclid operations in Georgia, Alabama, Florida and the eastern part of Tennessee.

Ginther Joins Smith Booth Usher Co. Albert W. Ginther, formerly general sales manager for Wood Manufacturing Co., North Hollywood, Calif., has been appointed sales manager of Smith Booth Usher Co., Distributors, Los Angeles, Calif.

Battin Now Export Sales Manager. Francis S. Battin, heretofore assistant export manager, has been named export sales manager for The Thew Shovel Co., Lorain, O. He has been with the company for 8 years, serving in various export and saels activities.

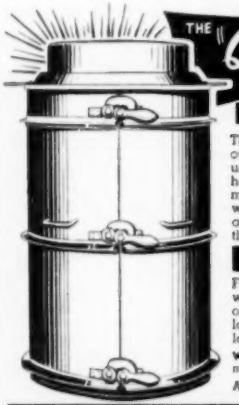
Bentley Appointed General Manager. Matthew J. Bentley, heretofore vice preisdent—manufacturing of Aeroquip Corporation, Packson, Mich., has been appointed vice president and general manager. He will be responsible for sales, engineering, financial and manufacturing functions.

U. S. Rubber Co. Appointments. J. J. Davison, heretofore Portland district manager, has been named manager of truck tire sales for the Fisk-Gillette tires division of United States Rubber Co., New York, N. Y. A. G. Richtmyer has been appointed district manager at Portland, Ore., and R. P. Buis has been named district manager at Kansas City.

Eeco Names Distributors. Eugene Engineering Co., Eugene, Ore., has named the following distributors to handle the sales of Eeco tractor mounted rock drills: Westmont Tractor & Equipment Co., Missoula and Kalispell, Mont.; Colorado Builders' Supply Co., Denver, Colo., and Casper, Wyo.; Western Machinery Co., Phoenix, Ariz.; Wheeler-Kershaw Co., Salt Lake City, Utah; Intermountain Equipment Co., Boise, Idaho and Spokane, Wash.; Seitz Machinery Co., Inc., Billings and Great Falls, Mont.; R. L. Harrison Co., Albuquerque, N. Mex.; Pacific Hoist & Derrick Co., Seattle and Puyallup, Wash.; Northern Commercial Co., Alaska and Yukon; Cascade Equipment Co., Eugene, Ore.; and Smith Booth Usher Co., Los Angeles, Calif.

Euclid Announces Sales Appointments. The Euclid Road Machinery Co., Cleveland, O., subsidiary of General Motors Corporation, has announced the following promotions in the sales organization. V. L. Snow, formerly manager, domestic sales has been promoted to the position of director of sales. E. F. Armington who has guided Euclid's sales activities for 22 years is resigning from active service but will continue to serve as a sales consultant. J. E. Ehlert has been named manager, domestic sales to fill the vacancy left by Mr. Snow's promotion. P. H. Malenchini, manager, export sales and R. W. Phillips, manager, defense requirements will continue to direct the activities of htose departments.

Territorial Changes for Galion Representatives. The Galion Iron Works and Mfg. Co., Galion, O., has announced the following territory revisions of their eastern and southern representatives, effective Jan. 1st. John C. Painter relinquishes New York state and takes over the states of New Jersey, Delaware, Virginia, and West Virginia. He also retains his coverage of Pennsylvania, Maryland, and District of Columbia. D. L. Gillispie relinquishes New Jersey and Delaware. His territory now includes the states of New York, Massachusetts, Rhode Island, Connecticut, Maine, New Hampshire, and Vermont. H. L. Moody in addition to his present territory of Louisiana, Mississippi, Alabama, and Arkansas, will have the states of Tennessee and Kentucky.



THE "Quinn Standard"

FOR CONCRETE PIPE

The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 40 years' service in the hands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that **Quinn pipe forms** and **Quinn mixing formulas** combine to produce the finest concrete pipe at lowest cost.

QUINN HEAVY DUTY PIPE FORMS

For making pipe by hand methods by either the wet or semi-dry processes. Built to give more years of service—sizes for pipe from 10" up to 120" and larger—tongue and groove or bell end pipe at lowest cost.

WRITE TODAY. Complete information, prices, and estimates sent on request.

Also manufacturers QUINN CONCRETE PIPE MACHINES

QUINN WIRE & IRON WORKS 1637 – 12th St. Boone, Iowa

SURPLUS INVENTORY

The George Bozich Estate, operators of the Monon Crushed Stone Co., wish to dispose of the following surplus inventory not needed in their operation:

2 KR11 International Trucks equipped with rear dump rock bodies.
2 1945 WA20 White Trucks equipped with rock bodies.
1 Link-Belt Steam Rail Crane, 50 ft. lattice boom, capacity 15 tons at 15 ft.
1 Osgood Drag-line equipped with 1½ cu. yd. drag-line bucket.
1 Bucyrus Erie Electric Shovel, model 50B, 2 cu. yd. capacity rock bucket.
1 Brown Hoist Shovel with clam crane attachments.
1 Allis Chalmers Rolls Crusher, 16" x 42" complete with V-Belt drives and belts.
1 Allis Chalmers Rolls Crusher, 14" x 30" complete with smooth face drive pulleys.
1 2 cu. yd. Kesler Clam Shell Bucket.
1 Allis Chalmers Mill with 26" wide feed complete with V-Belt drives.
1 No. 5 Jumbo Jr. Williams Hammer Mill complete with drives and 1,000 new extra hammers.
1 Street Bros. Mine Hoist equipped with drive drum, 5 ft. diameter to be powered by 100 H.P. electric motor or its equivalent.

Nicholas & George Bozich, Jr.
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Company Administrators
Monon, Indiana — Telephone Monon 4101

FOR SALE
AT REDUCED PRICE

Reason: Operation suspended

1 - 7W Monighan
1 - 1600 P&H 6 yard

The following to be sold as one lot:

3 - E-50 Tournarockers
2 - Extra tiers
1 - Air wrench
1 - 6000 gallon Propane Tank with the necessary pumps

WRITE OR PHONE 3105 POTTSVILLE

FRANK COLITZ
POTTSVILLE, PENNSYLVANIA

FOR SALE

Barber-Greene Trencher
Buckeye "406" Trencher
Buckeye "120" Trencher
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Hough "Payloader"
Austin 12-ton Roller
Galion Diesel Grader
Le Roi Rex 160 CF Compressor
1500 gal. water wagon w/pumps, jet, etc.

M E & S Co.
P. O. Box 182
SANTA CLARA, CALIF.
AXminister 6-5886

DEPENDABLE USED MACHINES
Bay City ¾ yd. dragline; new 1947
Lorain ¾ yd. shovel; rebuilt
Galion motor grader
Huber 5-8 ton tandem roller
40' bucket elevator
Diamond 9x18 jaw crusher

TRACTOR & EQUIPMENT CO.
10032 Southwest Highway, Oak Lawn, Ill.

ATTENTION
CONTRACTORS, COUNTY, CITY and TOWNSHIP OFFICIALS
WILL SACRIFICE !!

3—4 wheel drive 1½ ton Chevrolet Postal Dept. trucks—civilian made. Some van bodies & stake bodies.
1953 4 wheel drive Willys jeep station wagon with Ramsey front end winch. 3000 miles approx.
1—Steam boiler—U.S. Radiator, 6500 ft. Heat 20,000 sq. ft. Excellent condition. Required larger type for new plant.
1—1948 Spencer lowboy semi-trailer, single axle. 9.00 x 20, 12 ply tires.

Call E. C. Long
HIGHWAY EQUIPMENT COMPANY, INC.
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NOW! Get Circulation Where It Counts . . .

Roads and Streets' Clearing House REACHES THE MARKET'S HEART

INDIVIDUAL CONTRACTORS
CITY, COUNTY ENGINEERS
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Long a leader serving the heavy construction and associated fields, ROADS AND STREETS' "cream" circulation goes to the important men in the business. They are the men, who directly or indirectly influence the purchase and sales of new and used equipment and supplies.

When you are "in the market" reach the logical buyer or seller quickly —at a reasonable cost to yourself.

Use the Clearing House!

Just clip the coupon below and attach your copy.

CLIP YOUR AD COPY TO THIS HANDY ORDER FORM AND MAIL TO—

CLEARING HOUSE SECTION ADVERTISING RATES

TRANSIENT RATE—$10.00
Per Column Inch Per Insertion

CONTRACT RATES — BASED ON USE OF TOTAL SPACE INDICATED WITHIN YEARLY PERIOD.

12 in.	$9.50
24 in.	9.25
36 in.	9.10
48 in.	9.00
60 in.	8.80
90 in.	8.65
120 in.	8.50
180 in.	8.25
360 in.	8.00

COPY AND CLOSING DATES

Final closing date is the Fifteenth of the preceding month. Magazine is issued 1st of publication month. If proof desired, copy must be received 5 days preceding closing date.

CLEARING HOUSE SECTION
ROADS AND STREETS
22 W. MAPLE STREET, CHICAGO 10, ILL.

Please Insert the Attached Advertising Copy in the Next Issue of ROADS AND STREETS to Occupy.....Inches of Space.

Number of Insertions.....

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Company.....

Address.....

City.....State.....

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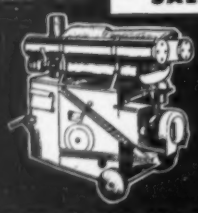
HEAT PORTABLE HEATER SALE!



108 FEET OF DUCTS INCLUDED!

250,000 B.T.U. PORTABLE HEATER & DRYER

SALE PRICE $199

Herman Nelson portable, powerful 250,000 B.T.U. gasoline or oil burning heaters with turbine-type blowers. 1½ h.p. air-cooled, ball bearing engine. 108 ft. of flexible, flameproof, waterproof ducts.

HEATING buildings under construction, shops, sheds, warehouses, barns, tunnels, hangars, spot-heating, etc.

DRYING concrete, plaster, mortar, paint, etc. Torrid blasts of heat.

PRE-HEATING engines, tractors, trucks, freight cars, equipment.

THAWING machinery, freight cars, tanks, pipelines, frozen areas, etc.

IMMEDIATE DELIVERY • SATISFACTION GUARANTEED OR PURCHASE PRICE REFUNDED

WIRE OR PHONE COLLECT • Your Heater can be shipped within 1 hour

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Since 1890

References: Dun & Bradstreet, Pueblo Savings & Trust Co.

171-1511 So. Santa Fe, Ph. 11704, Pueblo, Colo.

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VOS EQUIPMENT CO.
2575 W. 28th St. - Phone AR-64669
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1—Hobart Portable Skid Electric Welder—used 1 year.
1—Insley Dragline, ⅝ yard with Boom extension, with tread and tracks, G.M. Diesel motor—A-1 condition—used approx. 8 months.
1—D4 Caterpillar Bulldozer, A-1 condition. Looks new—used 2,200 hours.
1—Allis-Chalmers Model H5G Tractor Shovel. Used 30 days, NEW—Serial #D-5G19624.
1—Jaeger 2 Bag mixer, used 2 years. Good condition.

This equipment must be sold, priced accordingly.

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1 yd. Link-Belt shovel, crane, trench hoe.
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Fordson loader and blade.
Rapid paving breaker.
Tower with concrete hopper.
5 ton 3 wheel roller.
10 ton 3 wheel roller.
5 ton pull trailer.
D-8 Caterpillar tractor with dozer. 1H2279.
D-7 Caterpillar tractor with dozer, 3T series.
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Blaw-Knox Cement Bins, complete with elevators, batchers, unloading screws, and electric motors. Bins, both high and low storage, vary in size from 200 to 400 barrels. Excellent condition.

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Model 3500 Serial 3807 80' Boom, with 2½ yard Bucket, Caterpillar Diesel Engine Light Plant.

Bargain $39,000

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1 - 200 W "	8 c.y.
1 - 5 W "	6 c.y.
2 - 620 W PAGE	6 c.y.
1 - 1208 Bucyrus (Comb.)	6 c.y.
1 - 1250 P & H Electric Shovel	2½ c.y.

200W and 1208 used very little

Catalog of $2,000,000 used equipment furnished upon request.

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AIR HOISTS

5 - Used one Ton Detroit, type P, single strand, hook suspension type, 2000 lb. cap., 20 to 25' per min. hoisting speed, full load with 80 to 100 lb. air pressure, height of lift 12'.
Price: $225.00 each

3 - Used two Ton Detroit, type P, with hand chain propelled I-beam Monorail trolly, 4000 lb. cap. 12 to 14' per minute hoisting speed, full load, with 80 to 100 lb. air pressure, 10' height of lift.
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All above hoists are in operating condition.

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400 - Warren No. 43-A New A.E.R.A., Wt. 28 lbs. Length 60", size of spike 9/16" or 5/8". $6.00 in lots of 1 dz.

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Ideal for brick elevators, steel erection, Marine Railway, etc.

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1 IR Portable compressor, Model No. 315
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Joy heavyweight rotary blast hole drill. Diesel power, new in 1952.

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All above equipment in very good condition.

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Price $7000

Also 1—1949 G.M. with Tandem.

5 yd. Challenge Mixer.
Brand New $7000.00

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1 GT-30 Terratrac with Wagner loader

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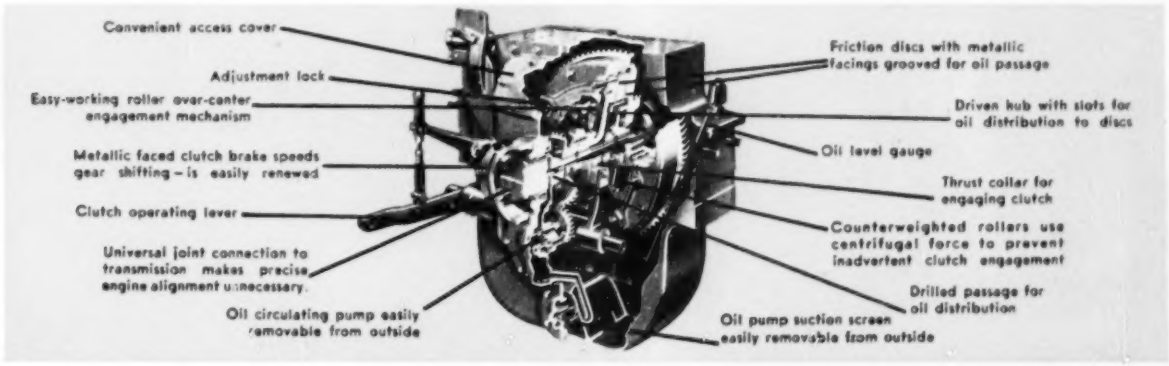
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Drilled passage for oil distribution
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